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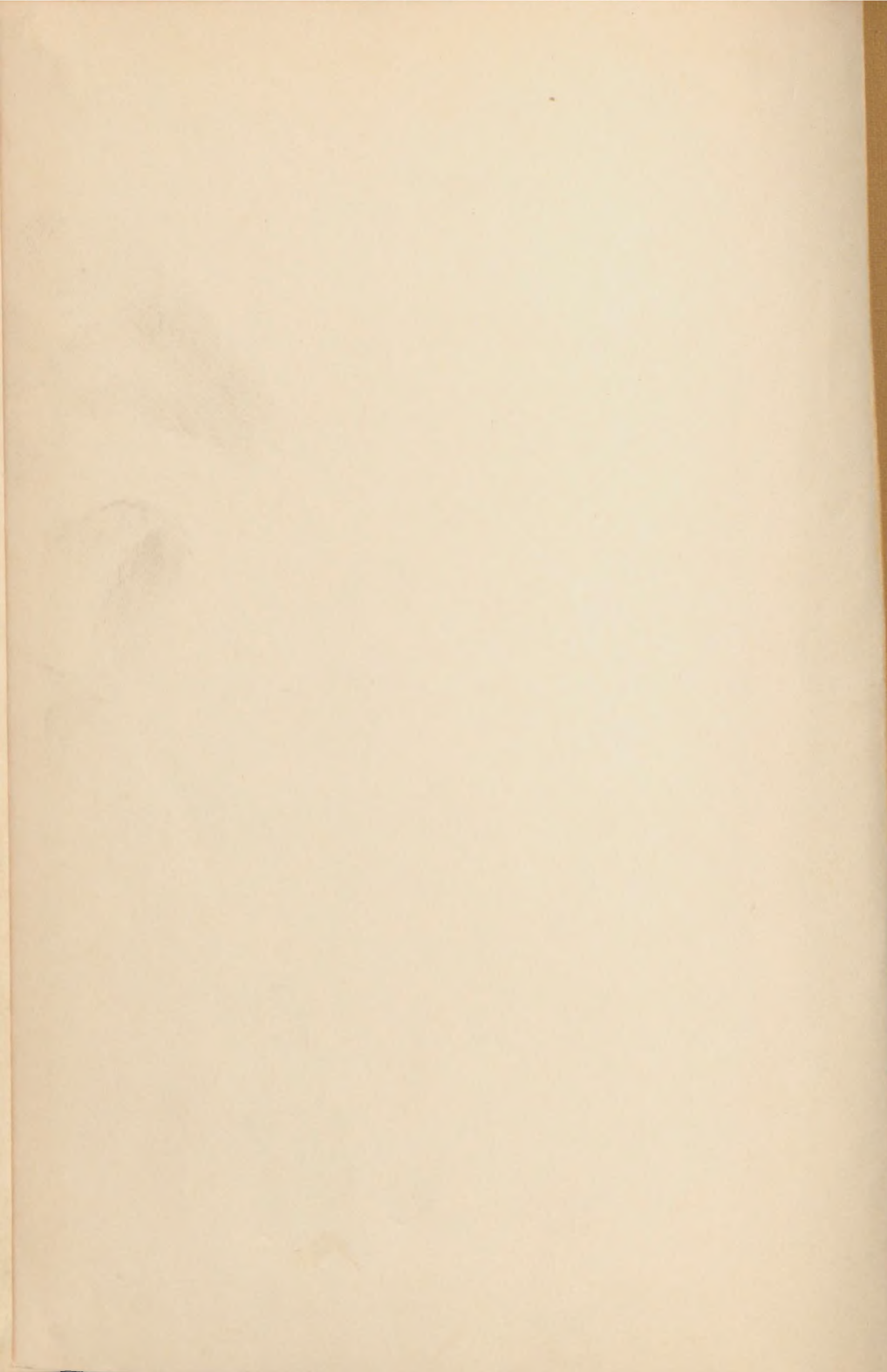


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BULLETIN

OF THE

BROOKVILLE SOCIETY

OF

NATURAL HISTORY.

NO. I. / 3

CONTENTS.

	Page.
<i>Stone Mounds on the Whitewater, by E. R. Quick.....</i>	3
<i>Observations on Faunal Changes, by A. W. Butler.....</i>	5
<i>The Flora of Franklin County.—Exogens, by O. M. Meyncke....</i>	13
<i>Microscopical Notes, by E. G. Grahn, M. D.....</i>	39
<i>Land and Fresh Water Mollusca observed in Franklin County, Indiana, by D. R. Moore and A. W. Butler.....</i>	41
<i>Two Hours Among the Fossils of Franklin County, Indiana, by D. R. Moore.....</i>	44

PUBLISHED BY THE SOCIETY.

O. M. MEYNCKE, }
C. F. GOODWIN, } *Editors.*

1885. / 98
J. M. COE, PRINTER,
RICHMOND, IND.

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BULLETIN

— OF THE —

Brookville Society of Natural History

No. 1.

CONTRIBUTIONS

— TO THE —

NATURAL HISTORY

— OF —

FRANKLIN COUNTY, INDIANA.

9827

RICHMOND, IND.:
J. M. COE, BOOK AND JOB PRINTER.

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BROOKVILLE SOCIETY OF NATURAL HISTORY.

The Brookville Society of Natural History was organized in the month of February, 1881, and one year from the date of its organization was incorporated under the laws of Indiana.

In membership, in name, and in actual results—enlarged interest in the study of nature, the establishment of a valuable museum, and the founding of a large and excellent library, the society has largely exceeded the expectations of its originators. What has been accomplished justifies the endeavor now made to issue a Bulletin which shall proclaim the worth of the Society, and afford such a medium of literary exchange as will bring it into relationship with scientists and scientific institutions all over the world. As may be seen from the list herein published, all departments of study in natural history are represented, and measures taken for the pursuit of research in all, under the supervision of competent curators. The local field of the Society presents the necessary material for each and every department to an extent in variety and abundance exceeding any other portion of the state. In the prosecution of its work the society has endeavored to make itself profitable to the community at large by means of scientific lectures given by lecturers invited from abroad.

It is to be hoped that this Bulletin is the first of many similar publications concerning our local Natural History. It will serve to strengthen us in the esteem of old acquaintances, and to make us new ones, of whom, one and all, we ask hearty co-operation.

BROOKVILLE, FRANKLIN COUNTY, INDIANA.

STONE MOUNDS ON THE WHITEWATER.

BY EDGAR R. QUICK.

The investigator of the traces left by former dwellers of this part of the Whitewater Valley finds many things to puzzle him; not the least interesting among them are the stone mounds, or what would in other countries be called cairns. While the common earthen tumuli are to be found on nearly every prominent eminence or terrace bordering the river valley, but three of the former, large enough to be of special interest to the investigator, are known to the writer, within the boundaries of the county. The so-called stone mounds are composed almost entirely of stone loosely heaped together, with only such intermixture of soil as has accumulated from the decay of vegetable substances that have gathered in the interstices between the stones. As originally built, I am led to think they were not mounds, but small enclosures, loosely built of stone, in rude dry walls, which have been thrown down by natural forces and the careless investigations of men who took no note of what they did or saw.

The three mentioned are now mere stone heaps, the smallest of which is situated on what is known as Boundary Hill, a spur of the Silurian formation which underlies and forms the sides of the valley. This hill is about two miles west of Brookville, on the West Fork of the Whitewater. The mound, when last visited by the writer, was but a low tumulus about twenty feet in diameter and scarcely two feet high, composed almost entirely of small rough stone, such as are found on all our hillsides where the Silurian rocks are near the surface. What little investigation was made disclosed a few broken human bones, among them the lower maxillary of a child, showing the permanent teeth protruding under the empty sockets of the temporary teeth; and animal bones, among which were those of the land turtle and the teeth of a fox or dog.

A second and somewhat larger mound is situated on one of the highest hilltops immediately north of Brookville, overlooking the town and the valley of the East Fork. The stone are somewhat smaller, completely covering the surface, but the whole appearance of the structure leads one to believe that they have been gathered and heaped upon the surface of an ancient earthen mound, as the superstructure bears every resemblance to other small earthen mounds in the vicinity. By inquiry I am informed that pits have been dug into it in past years, which disclosed human bones including one complete skeleton.

The third, which is the largest and most interesting, is situated on the highest point of a bold headland, overlooking the main river, three miles southeast of Brookville, on its eastern bank, and separating the river valley from that of Little Cedar Creek. This hill, which has long been known as "Brown's Hill," from the fact that a squatter by the name of Brown lived at its base at an early day, is of an oval base about one-half mile in length, its longer axis running north and south. It is joined at its northern extremity to the main ridge which separates the two valleys before mentioned. At its juncture with the main hill it is scarcely one hundred feet in height, but rises gradually in the form of a ridge, affording scarcely the width of an ordinary roadway on its top, more than two hundred feet to its highest point, near its southern extremity, when it declines abruptly to the river and terrace formation at its base. The highest point affords but a few square rods of level ground, which are entirely covered by the stone mound which is composed entirely of rough stone which have been gathered on the adjacent hillsides, which is proved by the fact that no loose stone small enough to be carried by hand are found near the mound. No stones larger than a strong man can carry are found in the composition of the mound, which is entirely of stone to its very base. The dimensions of the structure are about thirty by forty feet, and about four feet in height, the sides dropping over the sides of the hill, which are very steep at this point. A few years since an ash tree was growing on the top, near the center, having taken root in the soil which had gathered in the spaces between the stones, but it did not thrive and has decayed and disappeared. This mound has always been a place of interest to the people of the neighborhood, and many rude, unsystematic investigations have been made, but have developed very little regarding the object of the original structure. People who visited the place more than sixty years ago say that it was a walled inclosure of oval form, but little more than a rod in extent, consisting of a rude, dry wall a few feet high, and empty within except a confused mass of human bones heaped promiscuously at the bottom of the inclosed space. The searcher who delves for its secrets will now find numerous fragments of human bones, a few sherds of rude pottery, such as are now found on the most recent formations of the river valley. But what is more interesting is the fact that numerous bones of small mammals, birds, and the land turtle, also shells of the river mussel, of the same species now found in the river. Among the bones of mammals I have identified those of the fox, ground-hog, and muskrat. The observations of the writer and what has been learned from others leads to the thought that this class of structures are among the most recent in origin of all aboriginal remains in this part of the country. In the Southern States the erection of stone mounds are directly traceable to the modern Indians, even down to the advent of Europeans, while in the North among the Hurons, and many kindred

tribes, what was called the feast of the dead was celebrated every few years, when all the dead of each division or clan were collected and deposited in a common sepulcher, making such an accumulation of bones as would account for the quantity originally found at the Brown's Hill mound. In a case mentioned by the Jesuit missionary, Brebeuf, a pit was used instead of a walled inclosure, but the transition would not be great so long as the object seems to have been the collection and preservation of the remains of the dead. All through the valley rude implements and pottery are found which indicate that the country bordering the river was recently inhabited by barbarous men. The local collector knows of many sites where villages have been which contained a large population long since the builders of the mounds departed. By the washing away of the river banks, rude camp hearths are disclosed, showing traces which can be but two or three centuries old. All this and many more things leads the inquirer into this subject to ask what became of the dead. Occasionally a rude grave is discovered, often dug into a mound from the top, and a few cemeteries have been discovered where less than a score of graves are disclosed. The investigation of the history of the stone mounds has perhaps partially answered the question.

OBSERVATIONS ON FAUNAL CHANGES.

BY A. W. BUTLER.

It seems eminently proper that whatever changes there have been in the fauna of this part of Indiana, should be studied from Franklin County. One of the earliest settled counties of the State, it is, at the same time, one in which attention has been directed towards its natural features for as long a period, perhaps, as any other.

The observations of Dr. Rufus Haymond extend over a period of more than sixty years. It is seldom, in this western country, that one can cull from so long a period of investigation.

Climate and environment are chief factors in changes of animal life. We notice, perhaps, as great a lapse of time in this division of Indiana, as in any other part of the State; and the country has become much changed by reason of its occupation by white men. Most of the original forest has been removed; what little remains is almost cleared of the accumulated debris of the virgin woodland. Draining of sloughs and marshes, and changes of our water courses have caused a rapid diminution of examples of all water loving species. Especially is this noticable in ducks and geese which, while never found in great quantities, were some years since

much more numerous than now. The upland swamps have chiefly been drained leaving fewer haunts for the smaller waders. The only localities where I have ever taken Short-billed Marsh Wrens and Little Yellow Rails, one of my favorite snipe shooting grounds, has, within the last two years, been ditched and is now valued as tillable land.

I shall not speak of the animals which are generally recognized as having occupied this part of the Ohio Valley prior to the advent of the white race. The proximity of the "Big Bone Lick" in Kentucky, (about twenty-two miles nearly due south), would lead us to expect most of the prehistoric animals found there have been found in this County. The Whitewater and Big Miami Rivers form a natural water way in a southeasterly course to within five miles of this famous accumulation of remains.

Many species of mammals and birds are yet found in the newly settled portions of the State which have not been in this County for many years.

There are many minor changes in local natural history which have taken place in the last few years. I shall not take room at this time to speak of them in detail; a single instance will suffice. The English Sparrows have driven many species of birds from their accustomed haunts in towns and about the buildings of the farmers; Blue Birds, Carolina Wrens and Robins have left many places they formerly frequented, while the Purple Martin has been almost driven from the County. The streets of our town no more resound with the pleasant notes of many familiar birds, but there may be seen this aggressive little foreigner whose garrulous notes are heard on every hand.

My attention, at this time, will be chiefly confined to notes on the mammals and birds of this County. My thanks are due Dr. Rufus Haymond and Edgar R. Quick for assistance in preparing these notes.

CLASS MAMMALIA: MAMMALS.

SUB CLASS MONODELPHIA: PLACENTAL MAMMALS.

ORDER CARNIVORA: FLESH-EATERS.

FAMILY FELIDÆ: THE CATS.

Felis concolor, Linnæus.—Panther.—A former inhabitant of this County; known under the names: Cougar, Catamount and Painter; but has been extinct for some years. Since the settlement of this country, they were never very common. But few have been seen since about 1835. Two young were seen about four miles east of Brookville in 1838. The last one was seen about twenty years ago.

Lynx canadensis, Rafinesque.—Canada Lynx.—The Lynx was never common in Franklin County. There are but few reliable accounts of its capture. None have been seen for many years.

Lynx rufus, Rafinesque.—American Wild Cat.—Dr. Haymond (1869) says: "Occasionally there is a Wild Cat seen in this County, but they are rare." The last Wild Cat was seen here about fifteen years ago.

FAMILY CANIDÆ: THE DOG.

Canis lupus occidentalis, Coues.—Wolf.—This species which authors have separated into many varieties, and is known by many names, as: White Wolf, Gray Wolf, Red Wolf, Black Wolf, etc., was a former resident of this County. Wolves were a source of frequent annoyance to the early occupants of the Whitewater Valley. Some examples were taken up to within the last fifteen or twenty years, but the greater number had disappeared long before that.

Vulpes vulgaris pennsylvanicus, Coues.—Red Fox.—Dr. Haymond says 1869: "It is only within the last ten or fifteen years that the Red Fox has been observed in this County. Previously to that time we had none but the common Gray variety." Some authorities doubt the statement made above, but I have preferred to let it stand. I consider Dr. Haymond's statements, as a rule, worthy of acceptance. The Red Fox is now the common species in this locality.

Urocyon cinereo-argentatus, (Schreber), Coues.—Gray Fox.—"This species is very rare, but on account of its shy habits is probably more numerous than the number taken would indicate. In a residence of more than twenty years I have seen but three specimens. It apparently inhabits the dense thickets and woodland, while the Red Fox is constantly found in all parts of the County."—(E. R. Quick).

FAMILY MUSTELIDÆ: THE WEASELS.

Lutra canadensis, (Turton), Sabine.—American Otter.—"It is barely possible that a few of these animals still linger along Whitewater, though I have seen none for many years."—(Haymond, 1869). Prior to the date of this report, skins of the Otter were occasionally sold to fur traders at this place. The last one killed in this County was taken on the East Fork of Whitewater about five miles from Brookville.

FAMILY URSIDÆ: THE BEARS.

Ursus americanus, Pallas.—Black or Brown Bear.—Black Bears were once numerous in this part of the State. Many of our old citizens can tell of Bear hunts. The last Black Bear was seen here about 1839. Dr. Haymond says, in 1869: "The prints of their claws are yet plainly to be seen upon the smooth bark of hundreds of beech trees in the forests." A skull of this species, taken with the remainder of the skeleton from the hollow of a tree in the northwestern part of this County, a few years since, is in the collection of E. R. Quick.

ORDER UNGULATA: HOOFED ANIMALS.

FAMILY BOVIDÆ: BOVINE ANIMALS.

Bos americanus, Gmelin.—Bison.—This species, wrongly called "Buffalo," was evidently at one time one of the characteristic mammals of this part of the State. The first residents of this County met with them; the only location where they have been seen, of which I can learn, is in the neighborhood of "Little Cedar Creek," about four miles southeast of Brookville. Mr. E. R. Quick thinks he has seen the remains of this animal here.

The range of the Bison has been determined by investigators as extending over the Ohio Valley into West Virginia. The last representative of the species was killed in West Virginia in 1810 (Am. Nat. Vol. XIX, p. 197). The greater part of the Bisons disappeared from Ohio, Indiana, Illinois, and Kentucky about the year 1800. The last one in Ohio was killed at Gallipolis in 1795. The occurrence of this species in many parts of the Ohio Valley is mentioned by old historians. Their remains are found, according to Prof. N. S. Shaler, to be very common in the later deposits at the "Big Bone Lick" in Kentucky. I find in the "Journal of Col. Crogan," published in the "Monthly American Journal of Geology and Natural Science," Philadelphia, December, 1831, an account of his voyage down the Ohio River in 1765, the following notes which it may be proper to insert here: "May 30th, we passed the great Miami River, about thirty miles from the little river of that name, and on the evening arrived at the place where the Elephants' bones are found."

"31st. Early in the morning we went to the great Lick, where these bones are only found, about four miles from the river, on the southeast side. In our way we passed through a fine timbered clear woods; we came into a large road which the Buffaloes have beaten, spacious enough for two waggon to go abreast, and leading straight into the Lick." This author speaks of the "Buffalo" as frequently as of any other game, and from his notes I think it was as common as any of the larger animals.

Considering all these facts it is quite evident these animals left this country almost contemporary with its occupation by white men.

FAMILY CERVIDÆ: THE DEER.

Cervus canadensis, Erxleben.—Wapiti.—This species, commonly called Elk, was found to be comparatively rare in this vicinity at the time of its settlement. Like the Bison, the greater part of them had left the Whitewater Valley before many pioneers had penetrated this far into the wilderness. My grandfather bought a young Wapiti which was captured in the valley of Laughery creek, within the present limits of Ripley county, subsequent to 1810. The remains of this species are occasionally met with in various parts of the county. An antler was taken from the banks

of "Big Cedar Creek" in 1881, and is now in the collection of the Society of Natural History, at Brookville.

Cariacus virginianus, Gray.—Virginia Deer.—The Virginia or Red Deer was formerly a well known resident of this County. Its flesh formed a very important article of food for the early occupants of this valley. These Deer were common up to about 1845. My friend, Henry Berry, Jr., reports seeing one in 1847, in Ray Township, this County, and Dr. Haymond thinks an occasional one may have been seen not more than ten years since. Specimens of this species have been killed in the adjoining county of Ripley almost every winter up to the last few years. I am informed that some specimens have been taken in that County the present winter. The remains of this species are occasionally found in this County. An antler, in the collection of the Brookville Society of Natural History, was found fifteen feet below the surface in digging a mill race at Fairfield in 1881. The antlers of this animal and of the Wapiti were used by the prehistoric inhabitants of this region for many purposes; there is scarcely a collection of archaeological material in this part of the State but contains implements made of these materials.

ORDER RODENTIA: RODENTS OR GNAWERS.

FAMILY SCIURIDÆ: THE SQUIRRELS.

Sciurus carolinensis leucotis, Allen.—Northern Gray Squirrel; Black Squirrel.—"The black form of this variety was very common, at times, in this locality, being almost as abundant as the gray. It has however been rare for about forty years. In one locality, about four miles south of Brookville, several have been killed in the last few years, two of them perfectly black and others intergrading between this and the gray form."—(E. R. Quick).

Sciurus niger ludovicianus, Allen.—Western Fox Squirrel.—"About thirty years ago the Fox Squirrel made its first appearance in the neighborhood of Brookville, and has gradually increased in numbers until it has become the most numerous of the larger varieties" (Haymond, 1869). This species is still common in this County. They are residents and occupy the more open woodland. Frequently they inhabit for years a single tree, in an open field, some distance from any woods.

FAMILY CASTORIDÆ: THE BEAVERS.

Castor fiber, Linnaeus.—Beaver.—Beaver were at one time found, in some numbers, within the present limits of Franklin County. The remains of their houses and evidences of their work are still to be seen in some parts of Bath and Springfield Townships. There are persons still living who remember when Beaver were found in these localities. They were also found in certain localities along our rivers. A skull of this animal was obtained by Edward Hughes, in the spring of 1883, near the

mouth of "Yellow Bank Creek." This specimen is now in the collection of the local Society of Natural History.

FAMILY MURIDÆ: MICE AND RATS.

Mus rattus, Linnaeus.—Black Rat.—The Black Rat was the common representative of its genus in this County up to 1827; at this time the Norway Rat appeared and within a few years all of the former had left. A few lingered until about 1840.

Mus decumanus, Pallas.—Brown or Norway Rat.—"They first appeared in Brookville in the summer of 1827" (Haymond). This is now the common species; notwithstanding the means employed for its destruction, it appears to be as numerous as ever.

Mus musculus, Linnaeus.—House Mouse.—This little pest is a common species. It does not stray far from the habitations of man. I can not learn the date of its introduction into this region.

FAMILY HYSTRICIDÆ: PORCUPINES.

Erethizon dorsatus, F. Cuvier.—White-haired Porcupine.—The Porcupine was at one time not uncommon in this vicinity. Many of the old residents tell of their occurrence. The last one, of which I can learn, was killed about 1865.

CLASS AVES: BIRDS.

ORDER PASSERES: PERCHIERS.

SUB-ORDER OSCINES: SINGERS.

FAMILY TROGLODYTIDÆ: THE WRENS.

Thryomanes bewicki, (Aud.), Baird.—Bewick's Wren.—In 1856 Dr. Haymond had seen none of this species; between this time and 1869 he identified a few specimens. From that time to 1877 no specimens were recorded. In April of the latter year E. R. Quick identified four examples of this Wren. From that time to 1881 a few specimens were occasionally seen; since the latter date, however, each year has shown an increased number of specimens. At this time I consider it to be a summer resident and not uncommon.

FAMILY SYLVICOLIDÆ: WARBLERS.

Sub-Family SYLVICOLINÆ: Typical Warblers.

Dendroica cerulea, (Wils.), Baird.—Cerulean Warbler.—Formerly unknown from this locality. A few years since it was considered a rare bird here; now, excepting the Redstart, it is the most common of the tree inhabiting warblers.

FAMILY HIRUNDINIDÆ: THE SWALLOWS.

Petrochelidon lunifrons, (Say), Lawr.—Cliff Swallow, Eave Swallow. —“These Swallows first built their nests in this County in 1849. Previous to that time they were occasionally seen as migrants” (Haymond). They are now very common in certain localities. They sometimes occupy an out-building for years as a nesting place and then leave for a new site, perhaps never to return. But few colonies are found along the river-valleys: they appear to seek the upland.

FAMILY FRINGILLIDÆ: FINCHES, ETC.

Chondestes grammica, (Say), Bp.—Lark Finch.—This species was not recognized in this part of the State by any early investigators. It was first recognized in this County about 1877, and has appeared regularly every year since in increasing numbers. It is now not uncommon as a summer resident.

Passer domesticus, (Linn.), Leach.—European House Sparrow.—A common and unwelcome alien, known everywhere as “English Sparrow.” They first appeared in Franklin County in 1878. Since that time they have increased in numbers until they are now the most common representative of their family.

Spiza americana, (Gm.), Bp.—Black-throated Bunting.—Not recognized from this County until a few years since. Dr. Haymond had not seen it in 1869. Now its rattling note may be heard from almost every field of our upland farms.

FAMILY ICTERIDÆ: ORIOLES, ETC.

Sub-Family AGELAINÆ: Marsh Blackbirds.

Molothrus ater, (Bodd.), Gray.—Cowbird.—This species was, forty years ago, of rare occurrence in this region. It has steadily increased in numbers until it is now a common summer resident.

FAMILY CORVIDÆ: THE CROWS.

Sub-Family CORVINÆ: Typical Crows.

Corvus corax carinivorus, (Bart.), Ridg.—Raven.—None have been seen since 1868. They were formerly quite common in this County.

SUB-ORDER PICI: PICIFORM BIRDS.

FAMILY PICIDÆ: THE WOODPECKERS.

Campephilus principalis, (Linn.), Gray.—Ivory-billed Woodpecker.—“These birds were found in the swampy woodland in the eastern part of this County about sixty years ago” (Haymond).

Hylotomus pileatus, (Linn.), Baird.—Pileated Woodpecker.—A common resident at the time of the settlement of this County. This bird was known to the old settlers as “Woodcock” and “Black Woodcock.”

None have been seen here since 1845, but they are still found in the newly settled portions of the State.

ORDER PSITTACI: PARROTS.

FAMILY PSITTACIDÆ: PARROTS.

Sub-Family SITTACINÆ: Parroquets.

Conurus carolinensis, (Linn.), Kuhl.—Carolina Parakeet.—These birds were not uncommon at the early settlement of this County. Most of the old inhabitants know them by this name, and can give interesting accounts of their habits. The last Parakeets were seen here in 1828.

ORDER RAPTORES: BIRDS OF PREY.

FAMILY STRIGIDÆ: OWLS.

Strix nebulosa, Forst.—Barred Owl.—This Owl was formerly quite numerous in the Whitewater Valley. Of late years, they have been but rarely seen. In 1877 I obtained two specimens of this species which are the last I have known in the County.

FAMILY CATHARTIDÆ: AMERICAN VULTURES.

Catharista atrata, (Wils.), Less.—Black Vulture.—First identified in 1877; since which time it has been seen every winter. It is apparently becoming more common.

ORDER COLUMBÆ: COLUMBINE BIRDS.

FAMILY COLUMBIDÆ: PIGEONS.

Ectopistes migratoria, (Linn.), Sw.—Passenger or Wild Pigeon.—Within the last twenty years Wild Pigeons have been very common, but since 1875 few have been seen. Our old citizens tell of immense flocks, and wonderful "pigeon roosts" in this County. In January and February, 1854, there was a pigeon roost about two miles north of Brookville. I can scarcely credit accounts told me of their numbers at this time, yet the narrators are perfectly reliable and I am compelled to believe them. These birds are rapidly disappearing and in a few years will, I doubt not, be a thing of the past.

ORDER GALLINÆ: GALLINACEOUS BIRDS.

FAMILY MELEAGRIDÆ: TURKEYS.

Meleagris gallopavo americana, (Bartr.), Coues.—Wild Turkey.—Turkeys were as common here formerly, perhaps, as in any part of the Ohio Valley. They have gradually disappeared and I suppose there are none now to be found in the County. The last one was seen in this vicinity about six years ago. They are still occasionally killed in the adjoining County, Ripley.

FAMILY PERDICIDÆ: THE PARTRIDGES.

Sub-Family ODONTOPHORINÆ: American Partridges.

Oryx virginiana, (Linn.), Bp.—Bob-White; American Quail.—Formerly very numerous. They were found in considerable quantities up to the winter of 1878-9. The severe weather of that year destroyed many covies; since that time they have not increased much, if any in numbers.

It is very unsatisfactory to me, in studying the faunal changes of a locality, to find but a few notes in some local list of species. Thinking others may have found the same difficulty which I have encountered, I present above a compilation of my notes upon this subject. There is much more which I might include in this paper, but I have preferred to leave this with my notes on the other orders of our local fauna for a future article.

THE FLORA OF FRANKLIN COUNTY.—EXOGENS.

BY O. M. MEYNCKE.

The following list embraces the indigenous, naturalized, and adventive plants growing in Franklin County, Indiana. The list is more especially confined to the territory within the immediate vicinity of the Town of Brookville.

The author set out with the determination to exclude all from the list which he himself had not seen growing in the County. Hence some species whose existence here was supported by good authority, and which fact the author was reasonably certain, were omitted on the principle that it is much easier afterwards to add to the list than to take from it. Though he has botanized in the region for several years, he feels sure that there are a number of plants growing in the limits which have not been noticed. With the exception of a partial list of the trees reported by Dr. Rufus Haymond (1866) in making the observations of the local Flora no support has been derived from a predecessor in this branch of natural history.

Observations on the Flora of this County are reserved for a future number of the Bulletin of the Brookville Society of Natural History.

As far as the Order *Cuprifoliaceæ* the nomenclature and arrangement corresponds with that of Watson's Bibliographical Index to North American Botany, thereafter with that given in the latest edition of Gray's Manual of the Northern United States.

Some of the more recent changes are indicated by the placing of the synonyms in parenthesis.

RANUNCULACEÆ. (Crowfoot Family).

CLEMATIS, L.

C. Viorna, L. Leather-Flower. Frequent.

C. Virginiana, L. Common Virgin's Bower.

ANEMONE, L.

A. Virginiana, L. Virginian Anemone. Frequent.

A. dichotoma, L. Pennsylvanian Anemone. Woods and Meadows. Common.

A. acutiloba, Lawson. Sharp-lobed Hepatica. Common.

THALICTRUM, Tourn.

T. anemonoides, Michx. Rue-Anemone. Common.

T. dioicum, L. Early Meadow-Rue. Common in rocky woods.

T. purpuracens, L. Purple Meadow-Rue.

T. Cornuti, L. Tall Meadow-Rue.

RANUNCULUS, L.

R. abortivus, L. Small-flowered Crowfoot. Very common.

R. abortivus, L., var. micranthus, Gr.

R. recurvatus, Poir. Hooked Crowfoot.

R. fascicularis, Muhl. Early Crowfoot. Very common.

R. repens, L. Creeping Crowfoot. Common in damp places.

ISOPYRUM, L.

I. biternatum, Torr. & Gray. False Rue-Anemone. Frequent in moist shady places.

CALTHA, L.

C. palustris, L. Marsh Marigold. Rare.

AQUILEGIA, Tourn.

A. Canadensis, L. Wild Columbine.

DELPHINIUM, Tourn.

D. tricornis, Michx. Dwarf Larkspur. Very common.

D. Consolida, L. Field Larkspur.

HYDRASTIS, L.

H. Canadensis, L. Yellow-Root. Abundant.

ACTEA, L.

A. alba, Bigel. White Baneberry. Frequent.

CIMICIFUGA, L.

C. racemosa, Nutt. Black Snakeroot. Common.

MAGNOLIACEÆ. (Magnolia Family).

MAGNOLIA, L.

M. acuminata, L. Cucumber-tree. Rare.

LIRIODENDRON, L.

L. Tulipifera, L. Tulip-tree. Common.

ANONACEÆ. (Custard-Apple Family).

ASIMINA, Adans.

A. triloba, Dunal. Common Pawpaw.

MENISPERMACEÆ. (Moonseed Family).

MENISPERMUM, L.

M. Canadensis, L. Common.

BERBERIDACEÆ. (Barberry Family).

BERBERIS, L.

B. vulgaris, L. Common Barberry.

JEFFERSONIA, Barton.

J. diphylla, Pers. Twin-leaf. Abundant.

PODOPHYLLUM, L.

P. peltatum, L. May Apple. Mandrake. Common.

PAPAVERACEÆ. (Poppy Family).

PAPAVER, L.

P. somniferum, L. Common Poppy. Spontaneous near dwellings.

STYLOPHORUM, Nutt.

S. diphyllum, Nutt. Celandine Poppy. Common.

SANGUINARIA, Dill.

S. Canadensis, L. Blood-root. Common.

FUMARIACEÆ. (Fumitory Family).

DICENTRA, Bork.

D. Cucullaria, D. C. Dutchmans Breeches. Common.

D. Canadensis, D. C. Squirrel-Corn.

CORYDALIS, Vent.

C. flavula, Raf. Pale Corydalis. Common.

FUMARIA, L.

F. officinalis, L. Common Fumitory. About dwellings.

CRUCIFERÆ. (Mustard Family).

NASTURTIIUM, R. Br.

N. officinale, R. Br. Water Cress. Rare.

- N. palustre*, D. C. Marsh Cress. Common.
N. Armoracia, Fries. Horse Radish.

DENTARIA, L.

- D. lacinata*, Muhl. Cut-leaved Toothwort. Common.

CARDAMINE, L.

- C. rhomboidea*, D. C. Spring Cress. Common.
C. purpurea, Cham. & Schlecht. Purple Cress.
C. hirsuta, L. Small Bitter Cress. Not rare.

ARABIS, L.

- A. dentata*, Torr. & Gray.
A. lævigata, D. C. Common.
A. Canadensis, L. Sickie-pod.
A. hesperidoides, Gr. Frequent.

SISYMBRIUM, L.

- S. officinale*, Scop. Hedge Mustard.
S. canescens, Nutt. Tansy Mustard. Frequent.

BRASSICA, Tourn.

- B. Sinapistrum*, Boissier. English Charlock. Common.
B. alba, Gr. White Mustard.
B. nigra, Gr. Black Mustard.

CAPSELLA, Vent.

- C. Bursa-pastoris*, Moench. Shepherd's Purse. Abundant.

LEPIDIUM, L.

- L. Virginicum*, L. Wild Pepper-grass. Common.

CAPPARIDACEÆ. (Caper Family).

POLANISIA, Raf.

- P. graveolens*, Raf. Common along river banks.

VIOLACEÆ. (Violet Family).

LONNIDUM,

- L. concolor*, Benth. & Hook. Green Violet. Frequent on rich hillsides.

VIOLA, L.

- V. cucullata*, Ait. Common Blue Violet.
V. cucullata, Ait., var. *palmata*, Gr. Hand-leaf Violet. Common.
V. striata, Ait. Pale Violet. Frequent.
V. pubescens, Ait. Downy Yellow Violet. Common.
V. tricolor, L., var., *arvensis*, Gr. Pansy, Hearts Ease.

POLYGALACEÆ. (Milkwort Family).

POLYGALA, Tourn.

- P. Senega, L. Seneca Snakeroot.
- P. Senega, L., var. latifolia, Torr. & Gray.

CARYOPHYLLACEÆ. (Pink Family).

SAPONARIA, L.

- S. officinalis, L. Soapwort, Bouncing Bet. Common.

SILENE, L.

- S. stellata, Ait. Starry Campion. Frequent.
- S. Virginica, L. Fire Pink. Common.
- S. antirrhina, L. Sleepy Catch-fly. Frequent.

LYCHNIS, Tourn.

- L. Githago, Lam. Corn Cockle. Common in grain fields.

ARENARIA, L.

- A. serpyllifolia, L. Thyme-leaved Sandwort.

STELLARIA, L.

- S. Media, Smith. Common Chickweed. Abundant.
- S. pubera, Michx. Great Chickweed. Not common.

CERASTIUM, L.

- C. nutans, Raf. Common.
- C. arvense, L. Field Chickweed. Common.

PARANYCHIEÆ.

ANYCHIA, Michx.

- A. dichotoma, Michx. Forked Chickwood. Frequent in woods.

PORTULACACEÆ. (Purslane Family).

PORTULACA, Tourn.

- P. oleracea, L. Common Purslane. Abundant.

CLAYTONIA, L.

- C. Virginica, L. Spring Beauty. Common.
- C. Caroliniana, Michx.

HYPERICACEÆ. (St. John's-wort Family).

HYPERICUM, L.

- H. prolificum, L. Shrubby St. John's-wort. Frequent on dry banks and in thickets.
- H. perforatum, L. Common St. John's-wort. Frequent in fields.
- H. corymbosum, Muhl.
- H. mutilum, L. Dwarf St. John's-wort. Common in low ground.

MALVACEÆ. (Mallow Family).

MALVA, L.

M. rotundifolia, L. Common Mallow.

SIDA, L.

S. spinosa, L. Common everywhere.

ABUTILON, Tourn.

A. Avicennæ, Gaertn. Velvet Leaf. Common.

TILIACEÆ. (Linden Family).

TILIA, L.

T. Americana, L. Basswood Linden. Common.

LINACEÆ. (Flax Family).

LINUM, L.

L. Virginicum, L. Wild Flax. Frequent in dense woods.

L. usitatissimum, L. Common Flax. Escaped cultivation.

GERANIACEÆ. (Geranium Family).

GERANIUM, L.

G. maculatum, L. Wild Geranium. Common.

IMPATIENS, L.

I. pallida, Nutt. Pale Touch-me-not. Common.

I. fulva, Nutt. Spotted Touch-me-not. Frequent.

OXALIS, L.

O. violaceæ, L. Violet Wood-sorrel.

O. corniculata, L., var. stricta, Sav. Yellow Wood-sorrel.
Frequent.

RUTACEÆ. (Rue Family).

ZANTHOXYLUM, Colden.

Z. Americana, Mill. Northern Prickly Ash. Common.

PTELEA, L.

P. trifoliata, L. Shrubby Trefoil, Hop-tree. Common.

SIMARUBEÆ.

AILANTHUS, Desf.

A. grandulosus, Desf. Tree of Heaven.

ILICINEÆ. (Holly Family).

ILEX, L.

I. verticillata, Gr. Black Alder. Winter Berry. Rare.

CELASTRACEÆ. (Staff-tree Family).

CELASTRUS, L.

C. scandens, L. Waxwork, Climbing Bitter Sweet. Common.

EUONYMUS, Tourn.

E. atropurpureus, Jacq. Burning Bush. Waaho. Common.

E. americanus, L., var. *obovatus*, Torr. & Gr. Frequent on rich hillsides.

RHAMNACEÆ. (Buckthorn Family).

RHAMNUS, Tourn.

R. lanceolatus, Pursh. Buckthorn. Rare.

VITACEÆ. (Vine Family).

VITIS, Tourn.

V. labrusca, L. Northern Fox Grape. Rare.

V. æstivalis, Michx. Summer Grape. Common.

V. cordifolia, Michx. Winter or Frost Grape. Common.

AMPELOPSIS, Michx.

A. quinquefolia, Michx. Virginia Creeper. Common.

SAPINDACEÆ. (Soapberry Family).

STAPHYLEA, L.

S. trifolia, L. American Bladdernut. Not common.

ÆSCULUS, L.

Æ. glabra, Willd. Fetid or Ohio Buckeye. Common.

ACER, Tourn.

A. saccharinum, Wang. Sugar Maple. Abundant.

A. saccharinum, Wang, var. *nigrum*, Gr. Black Sugar Maple. Common.

A. dasycarpum, Ehrhart. White or Silver Maple. Common along streams.

A. rubrum, L. Red Maple. Common in wet woods.

NEGUNDO, Mœnch.

N. aceroides, Mœnch. Box Elder. Common.

ANACARDIACEÆ. (Cashew Family).

Rhus, L.

R. typhina, L. Staghorn Sumach. Common.

R. glabra, L. Smooth Sumach. Frequent.

R. copallina, L. Dwarf Sumach.

R. Toxicodendron, L. Poison Ivy. Common.

R. aromatica, Ait. Fragrant Sumach. Not rare.

LEGUMINOSÆ. (Pulse Family).

TRIFOLIUM, L.

- T. pratense, L. Red Clover.
- T. reflexum, L. Buffalo Clover.
- T. repens, L. White Clover.
- T. procumbens, L. Yellow or Hop-Clover. Frequent.

MELILOTUS, Tourn.

- M. alba, Lam. White Melilotus. Common.

MEDICAGO, L.

- M. lupulina, L. Black Medick.

AMORPHA, L.

- A. fruticosa, L. False Indigo. Rare.

ROBINIA, L.

- R. Pseudacacia, L. Common Locust Tree.

ASTRAGALUS, L.

- A. Canadensis, L. Milk Vetch.

DESMODIUM, D. C.

- D. nudiflorum, D. C.
- D. acuminatum, D. C.
- D. pauciflorum, D. C.
- D. rotundifolium, D. C.
- D. canescens, D. C.
- D. cuspidatum, Torr. & Gr. Frequent.
- D. paniculatum, D. C.
- D. Canadense, D. C.

VICIA, Tourn.

- V. Caroliniana, Walt. Frequent on rocky hillsides.

ASPIOS, Boerhaave.

- A. tuberosa, Moench. Ground-nut.

PHASEOLUS, L.

- P. diversifolius, Pers. Kidney Bean. Common.

AMPHICARPEA, Ell.

- A. monoica, Nutt. Hog Pea-nut.

BAPTISIA, Vent.

- B. leucantha, Torr. & Gr. False Indigo. Frequent on alluvial soil.

CERCIS, L.

- C. Canadensis, L. Red Bud. Common.

CASSIA, L.

- C. Marylandica, L. Wild Senna. Common.
- C. chamaecrista, L. Partridge Pea. Very common.

GYMNOCLADUS, Lam.

- G. Canadensis, Lam. Kentucky Coffee Tree.

GLEDITSCHIA, L.

- G. triacanthas, L. Honey Locust.

ROSACEÆ. (Rose Family).

PRUNUS, Tourn.

- P. Americana, Marshall. Wild, Yellow or Red Plum. Common.
- P. serotina, Ehrh. Wild Black Cherry.

NEILLIA, Don.

- N. opulifolia, Benth. & Hook. Nine-bark.

SPIREA, L.

- S. tomentosa, L. Hardhack, Steeple Bush.

GEUM, L.

- G. album, Gmelin. White Avens.
- G. Virginianum, L.
- G. vernum, Torr. & Gr.

POTENTILLA, L.

- P. Norvegica, L.
- P. Canadensis, L. Common Cinquefoil or Five Finger.

FRAGARIA, Tourn.

- F. Virginiana, Duch. var. Illinoensis, Gr. Wild Strawberry.

RUBUS, Tourn.

- R. strigosus, Michx. Wild Red Raspberry.
- R. occidentalis, L. Black Raspberry. Common.
- R. villosus, Ait. Common or High Blackberry.
- R. villosus, Ait. var. humifusus, Gr.
- R. Canadensis, L. Low Blackberry. Dewberry. Common.

ROSA, Tourn.

- R. setigera, Michx. Climbing or Prairie Rose.
- R. lucida, Ehrh. Dwarf Wild Rose. Frequent.
- R. rubiginosa, L. Eglantine. Sweet Brier.

CRATÆGUS, L.

- C. coccinea, L. Scarlet Fruited Thorn.
- C. tomentosa, L. Black Thorn. Common.
- C. tomentosa, L. var. mollis, Gr.
- C. Crus-galli, L. Cockspur Thorn. Frequent.

PIRUS, L.

P. coronaria, L. American Crab Apple. Common.

AMELANCHIER, Medic.

A. Canadensis, Torr. & Gr. Service Berry. Not rare.

SAXIFRAGACEÆ. (Saxifrage Family).

RIBES, L.

R. Cynosbati, L. Wild Gooseberry. Common.

R. floridum, L'Her. Wild Black Currant. Rare

HYDRANGEA, Gronov.

H. arborescens, L. Wild Hydrangea. Frequent.

HEUCHERA, L.

H. Americana, L. Common Alum Root. Frequent in rocky woodlands.

CRASSULACEÆ. (Orpine Family).

PENTHORUM, Gronov.

P. sedoides, L. Ditch Stone Crop.

SEDUM, Tourn.

S. ternatum, Michx. Stone Crop. Common.

S. Telephium, L. Live-for-ever. Escaped cultivation.

HAMAMELACEÆ. (Witch Hazel Family).

HAMAMELIS, L.

H. Virginica, L. Witch Hazel. Rare.

LIQUIDAMBER, L.

L. styraciflua, L. Sweet Gum. Bilsted. Rather common in moist woods.

LYTHRACEÆ. (Loosestrife Family).

LYTHRUM, L.

L. alatum, Pursh. Loosestrife.

ONAGRACEÆ. (Evening Primrose Family).

CIRCÆA, Tourn.

C. Lutea, L. Enchanters Nightshade. Common in rich woods.

GAURA, L.

G. biennis, L., *Gaura*. Not common.

EPILOBIUM, L.

E. coloratum, Muhl. Willowherb.

OENOTHERA, L.

O. biennis, L. Evening Primrose. Very common in old fields.

LUDWIGIA, L.

L. alternifolia, L. Seed-Box. Frequent.

L. palustris, Ell.

CURCUBITACEÆ. (Gourd Family).

SIYOS, L.

S. angulatus, L. One-seeded Star Cucumber. Common along river banks.

ECHINOCYSTIS, Torr. & Gr.

E. lobata, Torr. & Gr. Wild Balsam Apple. Common in rich soil along streams.

CACTACEÆ. (Cactus Family).

OPUNTIA, Tourn.

O. vulgaris, Haworth. Prickly Pear. Rare.

FICOIDEÆ. (Carpet-weed Family).

MOLLUGO, L.

M. verticillata, L. Carpet-weed.

UMBELLIFERÆ. (Parsley Family).

SANICULA, Tourn.

S. Canadensis, L., Sanicle. Black Snakeroot.

S. Marylandica, L.

DAUCUS, Tourn.

D. Carota, L. Common Carrot. Very abundant in old fields.

PASTINACA, Tourn.

P. Sativa, L. Common Parsnip. Abundant.

ARCHEMORA, D. C.

A. rigida, D. C. Cowbane.

THASPIUM, Nutt.

T. barbinode, Nutt.

T. aureum, Nutt.

T. trifoliatum, Gr.

PIMPINELLA, Benth. & Hook.

P. integerrima, Benth. & Hook.

CYSTopteris, D. C.

C. Canadensis, D. C. Honewort.

CHEROPHYLLUM, L.

C. procumbeus, Crantz. Chervil. Frequent.

OSMORRHIZA, Raf.

O. longistylis, D. C. Smoother Sweet Cicely. Frequent.

O. brevistylis, D. C. Hairy Sweet Cicely. Common.

CONIUM, L.

- C. maculatum, L. Poison Hemlock. Not uncommon.

ERIGENIA, Nutt.

- E. bulbosa, Nutt. Harbinger of Spring. Common.

ARALIACEÆ. (Ginseng Family).

ARALIA, Tourn.

- A. spinosa, L. Angelica Tree. Hercules Club. Rare.
 A. racemosa, L. Spikenard. Frequent.
 A. quinquefolia, Dec. & Planch. Ginseng. Common.

CORNACEÆ. (Dogwood Family).

CORNUS, Tourn.

- C. florida, L. Flowering Dogwood. Common.
 C. sericea, L. Silky Cornel.
 C. paniculata, L'Her. Panicked Cornel. Common in thickets and on river banks.
 C. alternifolia, L. Alternate-leaved Cornel. Not common.

NYSSA, L.

- N. multiflora, Wang. Tupelo. Black or Sour Gum. Common.

CAPRIFOLIACEÆ. (Honeysuckle Family).

SYMPHORICARPUS, Dill.

- S. racemosus, Michx. Snowberry. Escaped cultivation.
 S. vulgaris, Michx. Indian Currant. Coral Berry.

LONICERA, L.

- L. sempervirens, Ait. Trumpet Honeysuckle.

TRIOSTEUM, L.

- T. perfoliatum, L. Feverwort. Horse Gentian. Common in rich woods.
 T. Augustifolium, L. Frequent.

SAMBUCUS, Tourn.

- S. Canadensis, L. Common Elder.

VIBURNUM, L.

- V. prunifolium, L. Black Haw. Common.
 V. acerifolium, L. Maple-leaved Arrow-wood. Frequent.
 V. dentatum, L. Arrow-wood. Frequent in wet places.

RUBIACEÆ. (Madder Family).

GALIUM, L.

- G. Aparine, L. Cleavers. Goose-grass. Common.
 G. trifidum, L. Small Bedstraw. Variable. Common.
 G. triflorum, Michx. Sweet-scented Bedstraw.
 G. circæzens, Michx. Wild Liquorice.

CEPHALANTHUS, L.

C. occidentalis, L. Button Bush. Frequent in wet places.

MITCHELLIA, L.

M. repens, L. Partridge-berry. Common in dense woods.

HOUSTONIA, L.

H. purpurea, L. Common in woods and meadows.

H. cærulea, L. Bluets. Abundant in moist fields.

VALERIANACEÆ. (Valerian Family).

VALERIANA, Tourn.

V. pauciflora, Michx. Small-flowered Valerian. Common.

VALERIANELLA, (Fedia, Gaertn.)

V. radiata, (Fedia radiata, Michx.) Corn Salad. Lambs Lettuce.
Frequent in moist soil.

DIPSACEÆ. (Teasel Family).

DIPSACUS, Tourn.

D. sylvestris, Mill. Wild Teasel. Common.

COMPOSITÆ. (Composite Family).

VERNONIA, Schreb.

V. noveboracensis, Willd. Iron Weed. Very common.

V. fasciculata, Michx. Variable, passing into the above species.

KUHNTIA, L.

K. eupatorioides, L.

EUPATORIUM, Tourn.

E. purpureum, L. Joe-Pye weed. Common.

E. altissimum, L.

E. sessilifolium, L. Upland Boneset. Not common.

E. perfoliatum, L. Common Boneset.

E. ageratoïdes, L. White Snake-root. Very common along rich hillsides.

E. cælestinum, L. (*Conoclinium cælestinum*, D. C.) Mist Flower.

ASTER, L.

A. Shortii, Boott. Common.

A. undulatus, L. Frequent.

A. cordifolius, L. Common.

A. sagittifolius, Willd.

A. ericoides, L. Common.

A. ericoides, L. var. *villosus*, Gr.

A. multiflorus, Ait. Common in dry fields.

A. vimineus, Lam. (*A. Tradescanti*, L.)

A. vimineus, Lam. var. *foliolosus*, Gr. (*A. miser*, Ait.)

- A. tenuifolius, L.
- A. puniceus, L.
- A. prenathoides, Muhl.
- A. Novæ-Angliæ, L.

ERIGERON, L.

- E. Canadense, L. Horse-weed. Butter-weed. Very common.
- E. bellidifolium, Muhl. Robin's Plantain. Common.
- E. Philadelphicum, L. Common Fleabane.
- E. annuum, Pers. Daisy Fleabane. Sweet Scabious. Common.
- E. Strigosum, Muhl. Common.

SOLIDAGO, L. Golden-rod.

- S. latifolia, L.
- S. cæsia, L. Common.
- S. rugosa, Mill. (S. altissima, L.)
- S. ulmifolia, Muhl. Frequent.
- S. nemoralis, Ait.
- S. Canadensis, L. Very common.
- S. serotina, Ait. (S. gigantea, Ait.)
- S. serotina, Ait. var. gigantea, Gr. (S. serotina, Ait.)
- S. lanceolata, L. Frequent.

INULA, L.

- I. Helenium, L. Common Elecampane.

POLYMNIA, L.

- P. Canadensis, L. Leaf-cup. Abundant along shady ravines.
- P. Uvedalia, L.

SILPHIUM, L.

- S. perfoliatum, L. Cup-Plant. Not common.

AMBROSIA, Tourn.

- A. trifida, L. Great Ragweed. Very common.
- A. trifida, L. var. integrifolia, Gr.
- A. artemisiæfolia, L. Roman Wormwood. Bitterweed. Common everywhere.

XANTHIUM, Tourn.

- X. Canadense, Mill. (X. strumarium, L.) Common Cocklebur.
- X. spinosum, L. Spiny Clotbur. Rare.

HELIOPSIS, Pers.

- H. lævis, Pers. var. scabra, Gr. Common in thickets.

ECHINACEA, Mœnch.

- E. purpurea, Mœnch. Purple Cone-Flower. Very rare.

RUDBECKIA, L.

- R. laciniata, L. Cone-Flower.
- R. triloba, L. Common.
- R. hirta, L. Very common in meadows.

HELIANTHUS, L.

- H. annuus, L. Common Sunflower. Escaped from cultivation.
- H. parviflorus, Bernh. (H. microcephalus, Torr. & Gr.) Frequent in woods.
- H. divaricatus, L.
- H. decapetalus, L. Frequent.
- H. tuberosus, L. (H. doronicoides, Lam.) Common.

ACTINOMERIS, Nutt.

- A. squarrosa, Nutt. Common along streams.

COREOPSIS, L.

- C. tripteris, L. Tall Coreopsis. Common.
- C. trichosperma, Michx. Tickseed Sunflower.

BIDENS, L.

- B. frondosa, L. Common Beggar-ticks.
- B. connata, Muhl. Swamp Beggar-ticks.
- B. chrysanthoides, Michx. Larger Bur-Marigold. Frequent.
- B. cernua, L. Smaller Bur-Marigold.
- B. bipinnata, L. Spanish Needles. Common.

VERBESINA, L.

- V. helianthoides, Michx. (Actinomeris helianthoides, Nutt.)

DYSODIA, Car.

- D. chrysanthemoides, Lag. Fetid Marigold.

HELENIUM, L.

- H. autumnale, L. Sneezeweed. Not common.

ANTHEMIS, L.

- A. Cotula, L. (Maruta Cotula, D. C.) Common Mayweed.

ACHILLEA, L.

- A. Millefolium, L. Common Yarrow or Milfoil.

CHRYSANTHEMUM, L.

- C. Leucanthemum, L. (Leucanthemum vulgare, Lam.) Ox-eye, or White Daisy. Whiteweed. Common.

TANACETUM, L.

- T. vulgare, L. Common Tansy.

ARTEMISIA, L.

- A. biennis, Willd. Biennial wormwood. Frequent.

GNAPHALIUM, L.

- G. polycephalum, Michx. Common Everlasting.
 G. purpureum, L. Purple Cudweed.

ANTENNARIA, Gaertn.

- A. plantaginifolia, Hook. Plantain-leaved Everlasting. Common.

ERECTHITES, Raf.

- E. hieracifolia, Raf. Fire-weed. Common.

CACALIA, L.

- C. atriplicifolia, Muhl. Great Indian Plantain. Frequent in rich woods.

SENECIO, L.

- S. aureus, L. Golden Ragwort. Very common.
 S. aureus, L. var. obovatus, Torr. & Gr.

CNICUS, Vaill.

- C. lanceolatus, Hoffm. (*Cirsium lanceolatum*, Scop.) Common Thistle.
 C. altissimus, Willd. (*Cirsium altissimum*, Spreng.)

ARCTIUM, L.

- A. Lappa, L. (*Lappa officinalis*, Allioni.) Common Burdock.

KRIGIA, Schreber.

- K. amplexicaulis, Nutt. (*Cynthia Virginica*, Don.) Dwarf Dandelion. Cynthia. Frequent.

HIERACIUM, Tourn.

- H. scabrum, Michx. Rough Hawk-weed.

PRENANTHES.

- P. crepidinea, Michx. (*Nabalus crepidinea*, Cass.) Rattlesnake-root. Not common.

TARAXACUM, Haller,

- T. officinale, Weber. (*T. Densleonis*, Desf.) Common Dandelion.

LACTUCA, Tourn.

- L. Canadensis, L. Wild Lettuce.
 L. integrifolia, Bigel. (*L. Canadensis*, L. var. *integrifolia*, Torr. & Gr.)
 L. Floridana, Gaertn. (*Mulgedium Floridanum*, D. C.)

SONCHUS, L.

- S. oleraceus, L. Common Sow Thistle.
 S. asper, Vill. Spiny-leaved Sow Thistle.

LOBELIACEÆ. (Lobelia Family).

LOBELIA, L.

- L. cardinalis, L. Cardinal Flower. Rare.
- L. syphilitica, L. Great Lobelia. Common.
- L. inflata, L. Indian Tobacco. Very abundant.
- L. spicata, Lam. Not common.

CAMPANULACEÆ. (Campanula Family).

CAMPANULA, Tourn.

- C. Americana, L. Tall Bellflower. Common.

SPECULARIA, Heister.

- S. perfoliata, A. D. C. Venus Looking Glass. Common.

ERICACEÆ. (Heath Family).

CHIMAPHILA, Pursh.

- C. maculata, Pursh. Spotted Wintergreen. Not common.

MONOTROPA, L.

- M. uniflora, L. Indian Pipe. Corpse Plant. Frequent.
- M. Hypopitys, L. Pine-sap. False Beech-drops. Rare.

AQUIFOLIACEÆ. (Holly Family).

ILEX, L.

- I. verticillata, Gr. Black Alder. Winterberry.

EBENACEÆ. (Ebony Family).

DIOSPYROS, L.

- D. Virginiana, L. Common Persimmon.

PLANTAGINACEÆ. (Plantain Family).

PLANTAGO, L.

- P. major, L. Common Plantain.
- P. lanceolata, L. Rib-grass. Ripple-grass. English Plantain.
Common.
- P. Virginica, L. Frequent.

PRIMULACEÆ. (Primrose Family).

DODECATHEON, L.

- D. Meadia, L. Shooting Star. American Cowslip.

LYSIMACHIA, Tourn.

- L. quadrifolia, L.
- L. nummularia, L. Moneywort. Escaped cultivation.

STEIRONEMA, Raf.

- S. lanceolatum, Walt.
- S. lanceolatum, Walt. var. angustifolia, Gr.

SAMOLUS, L.

- S. valerandi*, L. var. *Americanus*, Gr. Water Pimpernel. Brook-weed. Not common.

BIGNONIACEÆ. (Bignonian Family).

TECOMA, Juss.

- T. radicans*, Juss. Trumpet Creeper. Frequent.

CATALPA, Scop. Walt.

- C. bignonioides*, Walt. Catalpa. Indian Bean. Frequent.

MARTYNIA, L.

- M. proboscidea*, Glox. Unicorn Plant. Rare.

OROBANCHACEÆ. (Broom-rape Family).

EPIPIEGUS, Nutt.

- E. Virginica*, Bart. Beech-drops. Common.

CONOPHALIA, Wallroth. Squaw-root. Cancer-root. Common.

SCROPHULARICEÆ. (Figwort Family).

VERBASCUM, L.

- V. Thapsus*, L. Common Mullein.

- V. Blattaria*, L. Moth Mullein. Common.

LINARIA, Tourn.

- L. vulgaris*, Mill. Toad-flax. Butter and Eggs.

SCROPHULARIA, Tourn.

- S. nodosa*, L. Figwort. Common.

COLLINSIA, Nutt.

- C. verna*, Nutt. Collinsia. Innocence. Not common.

PENTSTEMON, Mitchell.

- P. pubescens*, Solander. Common.

MIMULUS, L.

- M. ringens*, L. Monkey Flower.

- M. alatus*, Ait.

CONOBEA, Aublet.

- C. multifida*, Benth.

GRATIOLA, L.

- G. Virginiana*, L. Common.

- G. sphaerocarpa*, Ell. Rare.

ILYSANTHES, Raf.

- I. gratioloides*, Benth. False Pimpernel.

VERONICA, L.

- V. *Virginica*, L. Culvers-root. Culvers Physic.
- V. *Americana*, Schweinitz. American Brooklime.
- V. *serpyllifolia*, L. Thyme-leaved Speedwell.
- V. *peregrina*, L. Neckweed. Purslane Speedwell.
- V. *arvensis*, L. Corn Speedwell.

SEYMARIA, Pursh.

- S. *macrophylla*, Nutt. Mullein Foxglove. Common.

GERARDIA, L.

- G. *purpurea*, L. Purple Gerardia.
- G. *tenuifolia*, Vahl. Slender Gerardia.
- G. *quercifolia*, Pursh. Smooth False Foxglove.

PEDICULARIS, Tourn.

- P. *Canadensis*, L. Common Lousewort. Wood Betony.

ACANTHACEÆ. (Acanthus Family).

DIANTHERA, Gronov.

- D. *Americana*, L. Water willow. Common along the river, growing in water.

RUELLIA, L.

- R. *strepens*, L. Common.

VERBENACEÆ. (Vervian Family).

VERBENA, L.

- V. *angustifolia*, Michx.
- V. *hastata*, L. Blue Vervian. Very common.
- V. *utricifolia*, L. Nettle-leaved, or White Vervian. Very common.
- V. *stricta*, Vent. Hoary Vervian.
- V. *Aubletia*, L. Escaped cultivation.

LIPPA, L.

- L. *lanceolata*, Michx. Fog-fruit. Frequent on river banks.

LABIATÆ. (Mint Family).

TEUCRIUM, L.

- T. *Canadense*, L. American Germander. Wood Sage.

ISANTHES, Michx.

- I. *Cœruleus*, Michx. Common.

MENTHA, L.

- M. *viridis*, L. Spearmint.
- M. *piperata*, L. Peppermint.
- M. *Canadensis*, L. Wild Mint.

PYCANTHEMUM, Michx.

P. linifolium, Pursh. Mountain Mint. Frequent on clay soil.

CALAMINTHA, Moench.

C. Nepeta, Link. Basil-Thyme.

HEDEOMA, Pers.

H. pulegioides, Pers. American Pennyroyal. Common.

COLLINSONIA, L.

C. Canadensis, L. Rich-weed. Stone-root.

MONARDA, L.

M. fistulosa, L. Wild Bergamot. Common.

M. Bradburiana, Beck.

BLEPHILLA, Raf.

B. hirsuta, Benth.

LOPANTHUS, Benth.

L. nepetoides, Benth. Giant Hyssop. Common.

NEPETA, L.

N. Cataria, L. Catnip. Very common.

N. Glechoma, Benth. Ground Ivy. Gill. Very abundant.

SYNANDRA, Nutt.

S. grandiflora, Nutt. Abundant in rich woods.

PHYSOTEGIA, Benth.

P. Virginiana, Benth. False Dragon-head. Frequent.

BRUNELLA, Tourn.

B. vulgaris, L. Common Self-heal or Heal-all.

SCUTELLARIA, L.

S. versicolor, Nutt. Skull-cap. Common.

S. canescens, Nutt.

MARRUBIUM, L.

M. vulgare, L. Common Horehound.

GALEOPSIS, L.

G. Tretahit, L. Common Hemp-Nettle.

STACHYS, L.

S. palustris, L. Hedge Nettle.

S. aspera, Michx.

S. cordata, Riddell.

LEONURUS, L.

L. cardiaca, L. Common Motherwort.

LAMIUM, L.

L. amplexicaule, L. Dead Nettle. Frequent.

BORAGINACEÆ. (Borage Family).

LITHOSPERMUM, Tourn.

L. officinale, L. Common Gromwell.

L. latifolium, Michx.

MERTENSIA, Roth.

M. Virginica, D. C. Virginian Cowslip. Lungwort. Common.

MYCOTIS, L.

M. verna, Nutt. Forget-me-not.

ECHINOSPERMUM, Swartz.

E. Lappula, Lehm.

E. Virginicum, Lehm. (Cynoglossum Morisoni, D. C.) Beggar's
Lice. Very common.

CYNOGLOSSUM, Tourn.

C. officinale, L. Common Hound's Tongue.

C. Virginicum, L. Wild Comfrey.

HYDROPHYLLACEÆ. (Waterleaf Family).

HYDROPHYLLUM, L.

H. macrophyllum, Nutt. Common.

H. Virginicum, L. Frequent.

H. apendiculatum, Michx.

PHACELIA, L.

P. bipinnatifida, Michx. Common.

P. Purshii, Buckley. "Miami Mist." Very common.

POLEMONIACEÆ. (Polemonium Family).

POLEMONIUM, Tourn.

P. reptans, L. Greek Valerian. Common.

PHLOX, L.

P. divaricata, L. Common Phlox.

P. paniculata, L. Cultivated.

CONVOLVULACEÆ. (Convolvulus Family).

IPOMŒA, L.

I. purpurea, Lam. Common Morning Glory.

I. Nil, Roth. Smaller Morning Glory. Frequent.

I. lacunosa, L.

I. pandurata, Meyer. Wild Potato Vine. Man-of-the-Earth.
Common.

CONVOLVULUS, L.

C. sepium, L. (Calystegia sepium, R. Br.) Common along river
banks.

CUSCUTA, Tourn.

C. Gronovii, Willd. Dodder. Common on low grounds.

SOLANACEÆ. (Nightshade Family).

SOLANUM, Tourn.

S. nigrum, L. Common Nightshade.

S. Carolinense, L. Horse Nettle. Common.

PHYSALIS, L.

P. pubescens, L.

P. Virginica, Mill. (P. viscosa, L.)

P. lanceolata. (P. Pennsylvanica.)

NICANDRA, Adams.

N. physaloides, Gaertn. Apple of Peru. Frequent.

DATURA, L.

D. Stramonium, L. Thorn Apple. Jamestown-weed.

D. Tatula, L. Purple Thorn Apple. More abundant than the other species.

GENTIANACEÆ. (Gentian Family).

SABBATIA, Adams.

S. angularis, Pursh. Not common.

FRASERA, Walt.

F. Carolinensis, Walt. American Columbo. Common on dry hilly points.

GENTIANA, L.

G. quinqueflora, Lam. Five Flowered Gentian. Not common.

G. Andrewsii, Griseb. Closed Gentian. Not common.

APOCYNACEÆ. (Dogbane Family).

APOCYNUM, Tourn.

A. cannabinum, L. Indian Hemp. Common.

A. cannabinum, L. var. hypericifolium, Gr.

ASCLEPIADACEÆ. (Milkweed Family).

ASCLEPIAS, L.

A. Cornuti, Descainse. Common Milkweed. Silkweed.

A. phytolaccoides, Pursh. Poke Milkweed.

A. purpurascens, L. Purple Milkweed. Frequent.

A. quadrifolia, Jacq. Four-leaved Milkweed. Common in the woods.

A. incarnata, L. Swamp Milkweed. Common.

A. tuberosa, L. Butterflyweed. Pleurisy-root. Common.

ENSELINA, Nutt.

E. albida, Nutt. Common along river banks.

OLEACEÆ. (Olive Family).

FRAXINUS, Tourn.

- F. Americana, L. White or Gray Ash. Very common.
- F. viridis, Michx. Green Ash. Frequent along streams.
- F. sambucifolia, Lam. Black or Water Ash.
- F. quarangulata, Michx. Blue Ash. Common.

ARISTOLOCHIACEÆ. (Birthwort Family).

ASARUM, Tourn.

- A. Canadense, L. Wild Ginger. Abundant on rich hillsides.

PHYTOLACCACEÆ. (Pokeweed Family).

PHYTOLACCA, Tourn.

- P. decandra. Common Poke or Scape. Garget. Pigeon Berry.

CHENOPODIACEÆ. (Goosefoot Family).

CHENOPODIUM, L.

- C. album, L. Lamb's Quarter. Common.
- C. Botrys, L. Jerusalem Oak. Feather Geranium.

AMARANTACEÆ. (Amaranth Family).

AMARANTUS, Tourn.

- A. Hypochondriacus, L.
- A. retroflexus, L. Common.
- A. albus, L.

POLYGONACEÆ. (Buckwheat Family).

POLYGONUM, L.

- P. orientale, L. Prince's Feather. Escaped cultivation.
- P. Pennsylvanicum, L.
- P. Persicaria, L. Lady's Thumb.
- P. Hydropiper, L. Common Smartweed.
- P. acre, H. B. K. Water Smartweed.
- P. hydropiperoides, Michx. Wild Water Pepper.
- P. Virginianum, L. Common.
- P. aviculare, L. Knotgrass. Goosegrass. Doorweed. Very common.
- P. erectum, L. Common.
- P. sagittatum, L. Arrow-leaved. Tear Thumb.
- P. dumetorum, L. var. scandens, Gr. Climbing False Buckwheat. Common.

FAGOPYRUM, Tourn.

- F. esculentum, Moench. Buckwheat. Escaped cultivation.

RUMEX, L.

- R. Britannica, L. (R. orbicularis, Gr.) Great Water Dock.
- R. crispus, L. Curled Dock. Common.
- R. obtusifolius, L. Bitter Dock.
- R. Acetosella, L. Field or Sheep Sorrel. Common in cultivated fields.

LAURACEÆ. (Laurel Family).

SASSAFRAS, Nees.

- S. officinale, Nees. Sassafras. Common.

LINDERA, Thunberg.

- L. Benzoin, Meisner. Spicebush. Benjamin-Bush. Common.

THYMELEACEÆ. (Mezereum Family).

DIRCA, L.

- D. palustris, L. Leatherwood. Moosewood.

SANTALACEÆ. (Sandalwood Family).

COMANDRA, Nutt.

- C. umbellata, Nutt. Bastard Toad-flax. Not common.

EUPHORBIACEÆ. (Spurge Family).

EUPHORBIA, L.

- E. maculata, L. Common.
- E. hypericifolia, L.
- E. marginata, Pursh. Escaped cultivation.
- E. corollata, L. Not common.
- E. dentata, Michx.
- E. commutata, Engelm. Common.

ACALYPHIA, L.

- A. Virginica, L. Three-seeded Mercury. Common.

CROTONOPSIS, Michx.

- C. linearis, Michx. Common.

URTICACEÆ. (Nettle Family).

ULMUS, L.

- U. fulva, Michx. Slippery or Red Elm. Common.
- U. Americana, L. American or White Elm. Common.
- U. racemosa, Thomas. Corky White Elm. Frequent.

CELTIS, Tourn.

- C. occidentalis, L. Sugarberry. Hackberry. Common.

MORUS, Tourn.

- M. rubra, L. Red Mulberry.
- M. alba, L. White Mulberry.

MACLURA, Nutt.

M. aurantiaca, Nutt. Osage Orange. Frequent.

URTICA, Tourn.

U. gracilis, Ait. Nettle.

U. dioica, L.

LAPORTEA, Gaudichard.

L. Canadensis, Gaudichard. Wood Nettle. Common in rich woods.

Pilea, Lindl.

P. pumila, Gr. Richweed. Clearweed.

BOEHMERIA, Jacq.

B. cylindrica, Willd. False Nettle. Common.

CANNABIS, Tourn.

C. sativa, L. Hemp.

HUMULUS, L.

H. Turpulus, L. Common Hop.

PLATANACEÆ. (Plane-tree Family).

PLATANUS, L.

P. occidentalis, L. American Plane or Sycamore.

JUGLANDACEÆ. (Walnut Family).

JUGLANS, L.

J. cinerea, L. Butternut.

J. nigra, L. Black Walnut.

CARYA, Nutt.

C. olivæformis, Nutt. Pecan-nut. Escaped cultivation. Rare.

C. alba, Nutt. Shellbark or Shagbark Hickory. Very common.

C. microcarpa, Nutt. Small-fruited Hickory. Not common.

C. sulcata, Nutt. Western Shellbark Hickory. Frequent.

C. tomentosa, Nutt. Mocker-nut. White-heart Hickory. Common.

C. porcina, Nutt. Pig-nut Hickory. Very common on uplands.

C. amara, Nutt. Bitter Pig-nut Hickory. Common.

CUPULIFERÆ. (Oak Family).

QUERCUS, L.

Q. alba, L. White Oak. Very common.

Q. macrocarpa, Michx. Bur-Oak. Mossy-cup White Oak. Common on rich soil.

Q. bicolor, Willd. Swamp White Oak. Frequent on low grounds.

Q. Prinus, L. Chestnut Oak. Rare.

- Q. *Prinus*, L. var. *acuminata*, Michx. Yellow Chestnut Oak.
Common on rich soil.
- Q. *imbricaria*, Michx. Laurel or Shingle Oak.
- Q. *coccinea*, Wang. Scarlet Oak. Frequent.
- Q. *coccinea*, Wang. var. *tinctoria*, Gr. Yellow-barked or Black Oak. Common.
- Q. *rubra*, L. Red Oak. Common.
- Q. *palustris*, Du Roi. Swamp, Spanish or Pin Oak. Common on wet land.

FAGUS, Tourn.

- F. *ferruginea*, Ait. American Beech. Common.

CORYLUS, Tourn.

- C. *Americana*, Walt. Wild Hazel-nut. Frequent.

OSTYRA, Micheli.

- O. *Virginica*, Willd. American Hop-Hornbeam. Leverwood.

CARPINUS, L.

- C. *Americana*, Michx. Blue or Water Beech. American Hornbeam.

SALICACEÆ. (Willow Family).

SALIX, Tourn.

- S. *discolor*, Muhl. Glaucus Willow.
- S. *purpurea*, L. Purple Willow.
- S. *viminialis*, L. Basket Osier.
- S. *nigra*, Marsh. Black Willow.
- S. *alba*, L. var. *vitellina*, Gr. White Willow. Yellow Willow.
- S. *Babylonica*, Tourn. Weeping Willow.

POPULUS, Tourn.

- P. *tremuloides*, Michx. American Aspen. Common.
- P. *Grandidentata*, Michx. Large-toothed Aspen.
- P. *Monilifera*, Ait. Cottonwood. Necklace Poplar. Very common.
- P. *balsamifera*, L. var. *candicans*, Gr. Balm of Gilead.
- P. *dilatata*, Ait. Lombard Poplar.
- P. *alba*, L. White Poplar. Silver Poplar.

CONIFERÆ. (Pine Family).

JUNIPERUS, L.

- J. *Virginiana*, L. Red Cedar. Frequent.

MICROSCOPICAL NOTES.

BY E. G. GRAHN, M. D.

List of Microscopical forms of life found in the water in the neighborhood of Brookville and Cedar Grove, Franklin County, Indiana. Cedar Grove is a small town six miles southeast of Brookville. The locations referred to herein as Butler's Run and Pulp Mill are just north of the limits of the Town of Brookville; and Mill Pond is within the southern limit of the same Town. The specimens referred to as taken at Cedar Grove are from Ramsey's Creek near that Town.

The water in which these forms were found was taken during the past winter at the time of a thaw.

I desire to acknowledge the assistance of Prof. D. S. Kellicott and Mr. J. W. Ward, of Buffalo, N. Y., in the identification of many of the species of diatoms. Since these gentlemen did not furnish the names of authorities referred to, I have simply appended their initials to such forms as were identified with their assistance. All doubtful species are designated in the usual way.

DIATOMACEÆ.

- Gyrodontis pediculus*, K. & W. Pulp Mill. Scarce.
Cyclotella menighiniana, Vorce. Pulp Mill. Rather scarce.
Cyclotapleura solea, —. Cedar Grove. Very scarce.
Cymbella gastroides, VanHeurek. From all of the localities near Brookville. Quite numerous.
Cymbella helvetica, VanHeurek. From all of the localities near Brookville. Numerous.
Cymbella lanceolata, Ehr. From all of the localities near Brookville. Scarce.
Dinonigramma sp. 1, K. & W. Pulp Mill and Cedar Grove. Scarce.
Epithemia gibba, K. & W. Pulp Mill and Cedar Grove. Numerous.
Epithemia granulata, K. & W. Cedar Grove. Very scarce.
Eunotia parallela, —. Mill Pond, Cedar Grove and Pulp Mill. Uncommon.
Fragillaria ungeriana, Grunow. Pulp Mill. Scarce.
Gomphonema acuminatum, VanHeurek. Pulp Mill and Cedar Grove. Numerous.
Gomphonema acuminatum, VanHeurek. This is a short variety with abrupt bars. Pulp Mill. Rather scarce.
Gomphonema capitatum, K. & W. Cedar Grove. Scarce.

Microscopical Notes.

- Gomphonema constrictum*, Ehr. Pulp Mill and Cedar Grove. Numerous.
Gomphonema curvatum, K. & W. Numerous in all the water examined.
Gomphonema dicotoma, K. & W. Cedar Grove. Numerous.
Gomphonema geminatum, K. & W. Pulp Mill. Very scarce.
Gomphonema sp. ? Pulp Mill.
Gomphonema sp. ? Pulp Mill.
Gomphonema sp. ? Pulp Mill.
Gomphonema sp. ? Pulp Mill and Cedar Grove.
Thomochladia sigmoides, K. & W. Mill Pond. Very scarce.
Meridion constrictum. —. Numerous in all the water examined.
Navicula affinis, small form, K. & W. Pulp Mill and Cedar Grove.
 Numerous.
Navicula affinis, large form, K. & W. Pulp Mill and Cedar Grove.
 Numerous.
Navicula amphirynchus, K. & W. Cedar Grove. Very scarce.
Navicula angustata, K. & W. Pulp Mill and Cedar Grove. Numerous.
Navicula barclayi, Ehr. Pulp Mill and Butler's Run. Scarce.
Navicula cryptoccephala. —. A few in all of the water examined.
Navicula diephthalis, Vorce. Mill Pond and Pulp Mill. Scarce.
Navicula laurolobata, Prich. Pulp Mill and Butler's Run. Scarce.
Navicula stewarti, K. & W. Pulp Mill and Cedar Grove. Numerous.
Navicula placentula. —. Pulp Mill. Scarce.
Navicula timodis. —. Pulp Mill and Cedar Grove. Very scarce.
Navicula viridis, K. & W. Cedar Grove. Scarce.
Nitschia amphioxys. —. Long var. Pulp Mill. Scarce.
Nitschia bicephala. —. Mill Pond. Scarce.
Nitschia virens, K. & W. Mill Pond. Scarce.
Pinulobus (Navicula) major, K. & W. Cedar Grove. Scarce.
Pleurosigma spencerii. —. Pulp Mill. Very scarce.
Surirella limosa, K. & W. Pulp Mill. Rather scarce.
Surirella linearis, K. & W. Pulp Mill. Scarce.
Surirella minuta, K. & W. Pulp Mill. Very scarce.
Surirella oblonga, K. & W. Pulp Mill. Scarce.
Surirella ovata minor. —. Cedar Grove and Pulp Mill. Scarce.
Synedra arvens, K. & W. Pulp Mill and Cedar Grove. Abundant.
Synedra obtusa, K. & W. Pulp Mill. Rather scarce.
Synedra parallelogramm. —. Pulp Mill. Scarce.
Rhabdonema minutum, K. & W. Pulp Mill and Cedar Grove. Scarce.
Tabellaria sp. ? K. & W. Pulp Mill. Very scarce.
Tribonella gracilis, K. & W. Pulp Mill. Scarce.

DESMIDACEÆ.

- Cosmarium costatum*, Wolle. Mill Pond. Scarce.
Cosmarium pseudobroomii, Wolle. Mill Pond. Scarce.

RHIZOPODA.

- Amoeba villosa*, Leidys Rhiz, N. A. Mill Pond. Scarce.
Amoeba radiosa, Leidys Rhiz, N. A. Mill Pond. Scarce.
Diffugia globulosa, Leidys Rhiz, N. A. Mill Pond. Very numerous.
Diffugia pyriformis, Leidys Rhiz, N. A. Mill Pond. Scarce.
Hyalosphenia sp. ?, —. Mill Pond. Scarce.

LAND AND FRESH WATER MOLLUSCA OBSERVED IN
FRANKLIN COUNTY, INDIANA.

BY D. R. MOORE AND A. W. BUTLER.

This article presents such species of Land and Fresh Water Mollusca as have been identified by the authors while engaged in their investigations in other fields. No systematic collecting has been done. It is hoped that this list will be of assistance to some one, in completing the work here begun in the Malacological fauna of this County.

Our thanks are due R. M. Byrnes, M. D., of Cincinnati, O., for assistance in identifying some of the species.

UNIVALVES.

ORDER PULMONATA.

SUB-ORDER GEOPHILA.

FAMILY HELICIDÆ.

SUB-FAMILY VITRINIDÆ.

GENUS MACROCYCLIS.

- Macrocyclus conava*, Say. Common in woody places on the hills along the East and West forks of Whitewater River.

GENUS ZONITES.

- Zonites fuliginosus*, Griffith. Common on hillsides along all our streams.
lavigatus, Pfr. Not so common as the preceding.
athereus, Say. Found under bark of hickory trees. Not common.
fulvus, Drap. Plentiful.
minusculus, Binn. Scarce.
identatus, Say. Scarce.
viridulus, Menke. Very common.

GENUS LIMAX.

Limax campestris, Binn. Common.

SUB-FAMILY HELICINÆ.

GENUS HELIX.

Sub-Genus Patula.

Patula solitaria, Say. Very common.

alternata, Say. Very common.

perspectica, Say. Found in colonies under shelter of stones, or other bodies, in abundance.

striatella, Anth. Not common.

Sub-Genus Strobila.

Strobila labyrinthica, Say. Scarce.

Sub-Genus Stenotrema.

Stenotrema hirsutum, Say. Common in the woods.

monodon, var. *leaii*, Ward. Common.

var. *fraterna*, Say. Rather common.

stenotrema, Fer. Very common.

Sub-Genus Triodopsis.

Triodopsis palliata, Say. Fine specimens in marshy places.

inflecta, Say. Common.

tridentata, Say. Very common.

fallax, Say. Only a few dead specimens taken.

Sub-Genus Mesodon.

Mesodon albolabris, Say. Found generally over the County.

pennsylvanica, Green. Found in two localities near Brookville.

elevata, Say. Abundant.

exoleta, Binn. Common throughout the County.

thyroides, Say. Not plentiful.

clausa, Say. Found along our rivers above high water line.

mitchelliana, Lea. Once plentiful four miles North-west of Brookville, in the Whitewater bottom, (West Fork), but since the high water of 1883, have not been found.

profunda, Say. A few are found in our dense, damp woods.

multilineata, Say. Found in one place in Springfield Township.

Sub-Genus Vallonia.

Vallonia pulchella, Muller. Common.

var. *costata*, Muller. Common.

SUB-FAMILY PUPINÆ.

GENUS PUPA.

- Pupa armifera*, Say. Common.
contracta, Say. Common.
corticaria, Say. Common.
rupicola, Say. A few taken.

SUB-FAMILY SUCCININÆ.

GENUS SUCCINEA.

- Succinea avara*, Say. Not common.

SUB-FAMILY PHILOMYCIDÆ.

GENUS TEBENNOPHORUS.

- Tebennophorus carolinensis*, Bosc. Common everywhere.

SUB-ORDER LIMNOPHILA.

FAMILY AURICULINÆ.

GENUS CARYCHIUM.

- Carychium exiguum*, Say. Very common.

FAMILY LIMNÆIDÆ.

GENUS LIMNÆA.

- Limnæa palustris*, Muller. Not common.
humilis, Say. Found near Laurel.

GENUS PHYSA.

- Physa heterostrophæ*, Say. Abundant.
integra, Hald. Common in a branch of Big Cedar Creek in Spring-field Township.
gyrina, Say. Not uncommon.

GENUS PLANORBIS.

- Planorbis trivolvis*, Say. Common.
bicarinatus, Say. Found in Hydraulic Canal, and in ponds at Laurel Quarries.

ORDER PROSOBRANCHIATA.

FAMILY RISSOIDÆ.

GENUS SOMATOGYRUS.

- Somatogyrus isogonus*, Say. Found in Canal.

FAMILY STREPOMATIDÆ.

GENUS GONIOBASIS.

- Goniobasis semicariniata*, Say. Very common in Canal.

BIVALVES.

FAMILY NAIADÆ.

Sub-Genus Unio.

- Unio pressus*, Lea. Scarce.
multiplicatus, Lea. Scarce.
plicatus, Le S. Scarce.
lacrymosus, Lea. Plentiful.
occidens, Lea. Plentiful.
luteolus, Lam. Common.
parvus, Barnes. Very abundant.

Sub-Genus Margaritana.

- Margaritana complanata*, Lea. Plentiful.
marginata, Say. Very rare.
rugosa, Lea. Rare.

Sub-Genus Anodonta.

- Anodonta ferussaciana*, Lea. Not common.
imbecilis, Say. Common.
decora, Lea. Common.
plana, Lea. Very common.

FAMILY CORBICULADÆ.

GENUS SPHERIUM.

- Sphærium solidulum*, Prime. Very common.

TWO HOURS AMONG THE FOSSILS OF FRANKLIN COUNTY, INDIANA.

By D. R. MOORE.

Two hours may be to the enthusiastic geologist an aggravating limit; but in such a field for discovery and study as Franklin County presents, it is sufficient time to collect enough to occupy him in identification two hours multiplied by three. In pursuit of his favorite study, whether he climb the steep hillsides or wander beside the numerous watercourses, fossilized objects lie around him in plentiful abundance.

It was among those objects, that, during a two hour's walk, the genera and species represented in the following list, were found. Though observations in Lithology were varied and interesting, space will not

admit of notes thereon. It may be added, that, while some representatives of the fauna of the Upper Silurian were taken, the list is confined to representatives only of the Lower Silurian. What is herein presented gives but the most imperfect survey of what is, in fact, one of the richest fields in the State of Indiana.

BRACHIOPODA.

GENUS STROPHOMENA.

- Strophomena alternata*, Conrad.
- planumbona*, Hall.
- rhomboidalis*, Wilck.

GENUS ORTHIS.

- Orthis subquadrata*, Hall.
- occidentalis*, Hall.
- biforata*, var. *lynx*, Schol.
- insculpta*, Hall.
- emacerrata*, Hall.

GENUS RYNCHONELLA.

- Rynchonella capax*, Conrad.

GENUS ZYGOSPIRA.

- Zygospira modesta*, Say.

GASTEROPODA.

GENUS CYCLOMENA.

- Cyclomena bilix*, Conrad.

GENUS CYRTOLITES.

- Cyrtolites inornatus*, Hall.

GENUS PLEUROTOMARIA.

- Pleurotomaria*, —.

CRUSTACEA.

GENUS CALYMENE.

- Calymene senaria*, Conrad.

FOSSIL CORALS.

GENUS CLÆTETES.

- Clætetes Dalci*, E. and H.
- sub-pulchellus*, Nich.

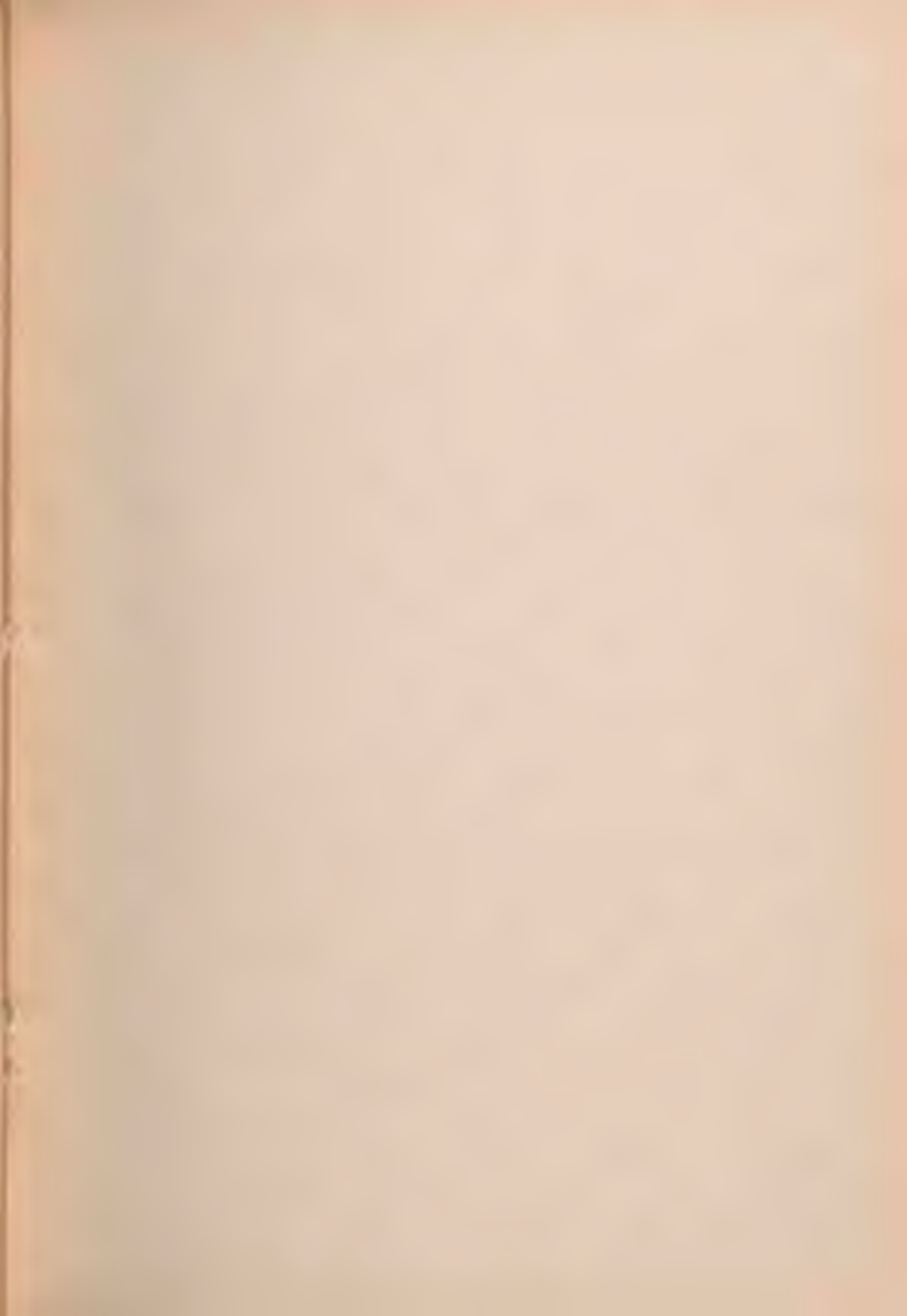
GENUS COLUMNOPORA.

- Columnopora cribriformis*, Nich.

GENUS STREPTELASMA.

- Streptelasma corniculum*, Hall.







BULLETIN

OF THE

BROOKVILLE SOCIETY

OF

NATURAL HISTORY.

No. 2.

CONTENTS.

	Page.
<i>Editorial</i>	2
<i>A List of the Fishes observed in the Vicinity of Brookville, Franklin County, Ind., by Barton W. Evermann</i>	3
<i>A List of the Birds observed in Franklin County, Ind., by Amos W. Butler</i>	12
<i>Preliminary List of Reptiles and Batrachians of Franklin County, by Edward Hughes</i>	40
<i>The Flora of Franklin County.—Endogens, by O. M. Mayneke</i> ..	45
<i>Fossil Corals of Franklin County, Ind., by David R. Moore</i>	50
<i>Errata</i>	52

PUBLISHED BY THE SOCIETY.

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BULLETIN

— OF THE —

Brookville Society of Natural History

No. 2.

CONTRIBUTIONS

— TO THE —

NATURAL HISTORY

— OF —

FRANKLIN COUNTY, INDIANA.

RICHMOND, IND.:
J. M. COE, BOOK AND JOB PRINTER.

1880.

EDITORIAL.

Our first attempt at publishing the results of our society's work has been so well received and we have had such encouraging words from scientific associations and individuals, both at home and abroad, that we have concluded to present the results of further studies of the natural history of our county. The primary object of the Brookville Society of Natural History is the collection of knowledge concerning the natural history of Franklin county, and we hope from time to time by means of such publications as this to give the results of such observations as we are permitted to make, which we think will be of interest to those interested in the efforts of a society organized for purely local work.

THE EDITORS.

A LIST OF THE FISHES OBSERVED IN THE VICINITY OF BROOKVILLE, FRANKLIN COUNTY, INDIANA.

By BARTON W. EVERMANN.

Through the kindness of the Brookville Society of Natural History, the Museum of the Indiana University has from time to time received small collections of fishes from the streams about Brookville. Upon these collections and a series of notes, by Mr. Edgar R. Quick, upon the game fishes of the locality, the present paper is based. The notes furnished by Mr. Quick are incorporated in the list and proper credit given for the same. That the local value of the list may be increased, references are made to each species as given in Jordan's Manual of Vertebrates, and Jordan and Gilbert's Synopsis of Fishes of North America. The number in parenthesis after each species is that of Dr. Jordan's "Catalogue of the Fishes known to Inhabit the waters of North America."

1. POLYODON SPATHULA (Walbaum). (100).

Paddle-fish; Spoon-bill Cat.

Polyodon folium, Jordan, Man. Vert., 344.

Polyodon spathula, Jordan & Gilbert, Synopsis, 83.

This strange fish made its appearance soon after the dams washed out, and is now occasionally seen. (*Quick*.) It is a common fish in all the large streams of the Mississippi Valley.

2. LEPIDOSTEUS OSSEUS (Linnæus). (107).

Gar Pike; Bony Gar.

Lepidosteus osseus, Jordan, Man. Vert., 342.

Jordan & Gilbert, Synopsis, 91.

Common since the destruction of the dams,—never observed before that time. As evidence that it breeds, I have taken young three or four inches in length in ponds left by summer freshets. (*Quick*.)

3. NOTURUS FLAVUS Rafinesque. (119).

Stout Cat.

Noturus flavus, Jordan, Man. Vert., 335.

Jordan & Gilbert, Synopsis, 100.

Mr. Quick reports this species as common.

A Catalogue of the Fishes known to Inhabit the Waters of North America, north of the Tropic of Cancer, with notes on the New Species discovered in 1883 and 1884. By David Starr Jordan. Washington: Government Printing Office; 1885.

4. LEPTOPS OLIVARIS (Rafinesque). (120).

Mud-Cat. Local name, Mississippi Cat.

Pelodichthys olivaris. Jordan, Man. Vert., 334.

Pelodictis olivaris, Jordan & Gilbert, Synopsis, 102.

"This species which was unknown here before the dams were destroyed, has become common since that time. It has been noticed that it does not 'school' in winter as many species do, but may be seen when the water is clear, scattered about over the bottom, never more than one in a place. Its principal food seems to be the common crawfish, as every one I opened contained remains of this crustacean which is very common here at times. Its favorite bait seems to be live minnows, of which it will swallow specimens of more than half its own length. A few years ago a neighbor caught upon a trot-line a specimen of this fish which had attempted to swallow a channel cat which had been caught upon the same hook. It succeeded in getting the head of the channel cat in its mouth when it, too, was hooked. The mud-cat was but a few inches longer than the fish it tried to swallow." (Quick.)

5. AMIURUS NATALIS (Le Sueur). (127).

Yellow Cat.

Amiurus natalis, Jordan, Man. Vert., 331.

Jordan & Gilbert, Synopsis, 105.

The collection of fishes received by the Indiana University from Brookville contains quite a number of specimens of this species. All were taken in the waste-way of the canal, where it is quite common.

6. ICTALURUS PUNCTATUS (Rafinesque). (134.)

Common Channel Cat.

Ichthylurus punctatus, Jordan, Man. Vert., 328.

Ictalurus punctatus, Jordan & Gilbert, Synopsis, 108.

Mr. Quick reports this species as quite common and as the principal object of the local fishermen.

7. ICTIOBUS VELIFER (Rafinesque). (148).

Quillback.

Carpiodes velifer, Jordan, Man. Vert., 321.

Carpiodes cyprinus, Jordan & Gilbert, Synopsis, 119.

According to Mr. Quick, this fish is very common in the streams about Brookville, where it is generally regarded as worthless as a food-fish.

8. CYCLEPTUS ELONGATUS (Le Sueur). (150).

Black Sucker; Black Horse.

Cycleptus elongatus, Jordan, Man. Vert., 320.

Jordan & Gilbert, Synopsis, 121.

While the dams were still in the river this was the most common sucker, but it seems to have disappeared entirely, as I have not seen a specimen for several years. (*Quick.*)

9. CATOSTOMUS NIGRICANS Le Sueur. (171).

Molly-hog; Hog Sucker; Stone Roller.

Hypentelium nigricans, Jordan, Man. Vert., 319.

Catostomus nigricans, Jordan & Gilbert, Synopsis, 130.

"Common, ascending creeks in spring as far as enough water can be found to cover their backs." (*Quick.*)

10. MOXOSTOMA MACROLEPIDOTUM (Le Sueur). (185).

Red Horse; White Sucker.

Moxostoma macrolepidota, Jordan, Man. Vert., 313.

Moxostoma macrolepidotum, Jordan & Gilbert, Synopsis, 140.

Common in the river. Breeds in May. (*Quick.*)

11. CAMPOSTOMA ANOMALUM (Rafinesque). (196.)

Stone-Roller; Stone-Lugger.

Campostoma anomalum, Jordan, Man. Vert., 287.

Campostoma anomalum, Jordan & Gilbert, Synopsis, 149.

A common and widely distributed species, running up small brooks in the spring to spawn.

12. PIMEPHALES PROMELAS Rafinesque. (218).

Fat-head; Black-head.

Pimephales promelas, Jordan, Man. Vert., 288.

Jordan & Gilbert, Synopsis, 158.

Two specimens of this species collected at Brookville are in the museum of the Indiana University.

13. PIMEPHALES NOTATUS (Rafinesque). (219).

Blunt nosed Minnow.

Hyborhynchus notatus, Jordan, Man. Vert., 288.

Hyborhynchus superciliosus, Jordan, Man. Vert., 289.

Pimephales notatus, Jordan & Gilbert, Synopsis, 159.

Pimephales superciliosus, Jordan & Gilbert, Synopsis, 160.

Specimens obtained from the Yellow-Bank Level of the Canal.

14. NOTROPIS MEGALOPS (Rafinesque). (273).

Shiner; Red-fin.

Luxilus cornutus, Jordan, Man. Vert., 293.

Mimilus cornutus, Jordan & Gilbert, Synopsis, 186.

Mimilus plumbeolus, Jordan & Gilbert, Synopsis, 192.

specimens from the Yellow-Bank Level of the Canal, where it is abundant.

15. *NOTROPIS RUBRIFRONS* (Cope). (310).
 Rosy-faced Minnow.
Minnilus rubrifrons, Jordan, Man. Vert., 296.
 Jordan & Gilbert, Synopsis, 202.
Minnilus percobromus, Jordan & Gilbert, Synopsis, 202.
 Specimens were taken from Yellow-Bank Level of Canal. An abundant and elegant little fish. .
16. *HYBOPSIS KENTUCKIENSIS* (Rafinesque). (328).
 Horned Chub; Jerker.
Ceraticthys biguttatus, Jordan, Man. Vert., 305.
 Jordan & Gilbert, Synopsis, 212.
Apocope ventricosa, Jordan & Gilbert, Synopsis, 211.
 "Abundant almost everywhere; the most widely diffused of all our fresh water fishes." (*Jordan.*)
 Specimens from the Yellow-Bank Level of Canal.
17. *NOTEMIGONUS CHRYSOLEUCUS* (Mitchill). (418).
 Shiner; Bream.
Notemigonus chrysoleucus, Jordan, Man. Vert., 301.
 Jordan & Gilbert, Synopsis, 250.
Notemigonus leptosomus, Jordan & Gilbert, Synopsis, 249.
 Yellow-Bank Level of Canal. "New England to Minnesota and south; abundant in bayous, ponds, and weedy streams. This species is much more tenacious of life than is any other of our Cyprinoids." (*Jordan.*)
18. *ANGUILLA ANGUILLA ROSTRATA* (Le Sueur). (638).
 Common Eel.
Anguilla rostrata, Jordan, Man. Vert., 338.
 Jordan & Gilbert, Synopsis, 361.
 A few taken every season. (*Quick.*)
19. *POMOXYS ANNULARIS* Rafinesque. (842).
 New Light.
Pomoxys annularis, Jordan, Man. Vert., 247.
 Jordan & Gilbert, Synopsis, 464.
 "Common in the Canal, but seldom taken in the swiftly-running streams. Years ago this fish was taken often in the river, but it has almost disappeared since the destruction of the dams." (*Quick.*)
20. *AMBLOPLITES RUPESTRIS* (Rafinesque). (845).
 Red-Eye; Rock Bass; Goggle Eye.
Ambloplites rupestris, Jordan, Man. Vert., 237.
 Jordan & Gilbert, Synopsis, 466.

Formerly very common when the channel of our river afforded its favorite retreats about sunken logs and roots, but it is but rarely taken now. (*Quick.*)

21. LEPOMIS CYANELLUS Rafinesque. (853).

Blue-Spotted Sun-Fish.

Apomotis cyanellus, Jordan, Man. Vert., 239.

Lepomis cyanellus, Jordan & Gilbert, Synopsis, 473.

Specimens of this common species in the collection were obtained in the Waste-Way of the Canal.

22. LEPOMIS MEGALOTIS (Rafinesque). (864).

Blue and Orange Sun-Fish; Long-eared Sun-Fish.

Xenotis megalotis, Jordan, Man. Vert., 242.

Lepomis bombifrons, Jordan, Man. Vert., 240.

Jordan & Gilbert, Synopsis, 478.

Lepomis megalotis, Jordan & Gilbert, Synopsis, 477.

This species is generally abundant. There are specimens in the collection from Yellow-Bank Level and Waste-Way of Canal.

23. MICROPTERUS SALMOIDES (Lacepede). (876).

Large-mouthed Black Bass.

Micropterus pallidus, Jordan, Man. Vert., 236.

Micropterus salmoides, Jordan & Gilbert, Synopsis, 484.

While this bass is sometimes taken, according to Mr. Quick, it is not nearly so common as the next.

24. MICROPTERUS DOLOMIEI Lacepede. (877).

Small-mouthed Black Bass.

Micropterus salmoides, Jordan, Man. Vert., 236.

Micropterus dolomieu, Jordan & Gilbert, Synopsis, 485.

"Sometimes common after winters favorable for its preservation, suppressed to be swept out by the ice when large gorges occur. Nests in May or June, as the spring is early or late." (*Quick.*)

25. ETHEOSTOMA NIGRUM Rafinesque. (885d.)

Johnny Darter.

Etheostoma nigrum, Jordan, Man. Vert., 224.

Jordan & Gilbert, Synopsis, 492.

Specimens from Little Cedar Creek four miles south of Brookville. An abundant species.

26. ETHEOSTOMA BLENNIOIDES Rafinesque. (894.)

Green-sided Darter.

Diplesium blennioides, Jordan, Man. Vert., 222.

Jordan & Gilbert, Synopsis, 497.

All the specimens received from Brookville were taken in Little Cedar Creek.

27. *ETHEOSTOMA CAPRODES* (Rafinesque). (899.)

Log Perch; Hog Fish.

Percina Caprodes, Jordan, Man. Vert., 219.

Jordan & Gilbert, Synopsis, 499.

Two specimens from Waste-Way of Canal.

28. *ETHEOSTOMA ASPRO* (Cope & Jordan). (902.)

Black-sided Darter; Blenny Darter.

Alcedius aspro, Jordan, Man. Vert., 220.

Jordan & Gilbert, Synopsis, 501.

A specimen from Yellow-Bank Level of Canal.

29. *ETHEOSTOMA VARIATUM* Kirtland. (912).

"Blind Simon."

Hadropterus tessellatus, Jordan, Man. Vert., 222.

Nanostoma tessellatum, Jordan & Gilbert, Synopsis, 511.

Since 1840, when Dr. Kirtland described this fish, it has been lost, or confounded with allied species until quite recently. In April, 1885, through the kindness of Mr. Angus W. Brame, Dr. Jordan came to possession of two specimens of which he published a description in the *Proceedings of the United States National Museum* for 1885, pp. 163-165. Because of the "local interest" attaching to the specimens, I am permitted to quote the article entire.

"In the Boston Journal of Natural History, 1840, pp. 274-276, Dr. Kirtland has described two species of Darters, under the names of *Etheostoma variata* and *Etheostoma maculata*. The account of these has been till lately known only from specimens in the National Museum, collected by Dr. Kirtland and Professor Baird in the original locality. Lately, on comparison of these specimens with others from Tennessee, Professor Gilbert has recognized the identity of *Etheostoma maculata* with the *Percichthys sanguifluus*, of Cope."

"The *Etheostoma variata* has been less fortunate. Kirtland himself regarded it as identical with the later-described *Etheostoma caerulea* of 1809, and under the name of *Percichthys variatus*, Agassiz made the latter species the type of his genus *Percichthys*. Putnam and Vaillant have correctly considered the *Etheostoma variata* as different from the *Percichthys caerulea*, but they have given no explanation of the grounds of their opinion.

"In my earlier papers I have adopted Dr. Kirtland's view that the *Etheostoma variata* is the same as *Percichthys caeruleus*. The resemblance

in color of the two seemed to support this opinion, and the discrepancies in the description and figure were supposed to be due to inaccuracies on Dr. Kirtland's part.

"In the Synopsis of the Fishes of North America, p. 503, Professor Gilbert and myself have adopted the view that Dr. Kirtland's figure and description were based on a specimen of *Hadropterus peltatus*, Stauffer, to which the coloration of *Peciliichthys cornutus* had been ascribed.

"I have recently received two specimens of a Darter, taken in the White Water River at Brookville, Indiana, by Amos W. Butler. The larger of these, 11 inches long, an adult male, agrees very closely with Dr. Kirtland's description of *Etheostoma variatum*, and is evidently the species which Dr. Kirtland had in mind.

"It is a species previously unknown to me (except from two discolored and ill-preserved specimens—the types of *Hadropterus tessellatus*), and its rediscovery forms an important addition to our knowledge of these fishes.

"The following is the synonymy of the species, with a description of my largest specimen :

"HADROPTERUS VARIATUS.

Etheostoma variatum, Kirtland, Zool. Ohio, 1838, 168, 192; Kirtland, Boston Journ. Nat. Hist., iii, 1840, 274. (Mahoning R.)

Hadropterus variatus, Putnam, Bul. Mus. Comp. Zool. 1, 1863, 4. (Name only.)

Belcosoma variatum, Vaillant, Recherches sur les Poiss., *Etheostomatide*, 1874, 84. (Locality Unknown.)

Alcedius variatus, Jordan and Gilbert, Syn. Fish. N. A., 1883, 503. (In part confused with *Hadropterus peltatus*, Stauffer.)

Etheostoma notatum, Agassiz, MSS., 1850, fide Putnam. (No description.)

Hadropterus tessellatus, Jordan, Bull. U. S. Nat. Mus., x, 7, 1877. (Allegheny R.; young specimens discolored.)

Nanostoma tessellatum, Jordan and Gilbert, Syn. Fish. N. A., 1883, 511. (Dorsal spines given as "x," not xiii, by misprint.)

"Head $3\frac{1}{2}$ times in length ($4\frac{1}{2}$ to base of caudal). Depth, $4\frac{1}{2}$ ($5\frac{1}{2}$). D. XIII-13; A. II, 9. Scales 8-51-9. Length, $3\frac{1}{2}$ inches.

"Body moderately elongated, not much compressed, the back somewhat arched. Head short and thick, the snout short and blunt, and the profile above the eyes strongly depressed, profile a little depressed at the nape. Eyes large, not very close together, slightly longer than snout, $3\frac{3}{4}$ in head.

"Mouth small, low, subhorizontal, the lower jaw included; teeth small, subequal, bluntnish, in rather broad bands; teeth on vomer. Premaxillary not protractile; maxillary reaching front of eye; 3 in head. Top

of head extremely rugose, the wrinkles evident through the skin, and radiating irregularly from behind the eye. Parietal region rather broad and depressed, as in other species of *Hadropterus*. Preopercle entire. Opercle with a rather sharp spine. Gill membranes somewhat broadly united, but meeting at a rather acute angle.

"Head naked, except for one to three scales on the upper part of the opercle. Scales of body rather large, ctenoid. Lateral line complete. Nape covered with small scales; breast loosely scaled; belly covered with ordinary scales similar to those on the sides. No enlarged ventral plates.

"Fins all very large. Dorsal fins slightly joined; anal fin large, but lower than the soft dorsal, and somewhat shorter. Pectorals reaching front of anal. Second anal spine longer than first; body of moderate size. Longest dorsal spine $2\frac{1}{2}$ in head. Longest soft ray $1\frac{1}{2}$. Caudal subtruncate, its longest ray $1\frac{1}{2}$ in head. Longest ray of anal 1. Pectoral a little longer than head; ventral a little shorter.

"Color of large male specimen dusky greenish above, the head similar; the centers of the scales darker, and the whole body covered with fine dark points visible with a lens. Belly and sides of the body from anal fin forward and as high up as the level of the scapula of a bright yellow-orange. Posterior parts of the body with five verticle zones of bright orange, these about half as broad as the dark greenish interspaces; first zone opposite the interspace between the dorsals, and extending downward to the front of anal; the last two on caudal peduncle. A vague, dusky area on base of caudal; a dusky shade across nape in front of dorsal. Head nearly plain, with some dark specks and some dashes of orange. Breast with light orange shades.

"First dorsal with a broad median band of blue-black; a paler stripe below it and above it; the base of the fin with dark interspersed spots, and the edge of the fin again blackish. Second dorsal blue-black dashed with orange toward the base; caudal blackish, rather darker at base; anal blue-black, with orange-yellow at the base; pectoral blackish, with orange cross shades; ventrals blue-black, with some edgings of orange.

"The young example is similarly marked, but has less dusky shading, the fins being mostly pale.

"These specimens were obtained in a hydraulic canal above Brookville, Indiana, by Mr. Amos W. Butler, April 25, 1885.

"INDIANA UNIVERSITY, April 29, 1885."

30. *ETHEOSTOMA ZONALE* (Cope.) (916).

Zoned Darter.

Nanostoma zonalis, Jordan, Man. Vert., 225.

Nanostoma zonale, Jordan & Gilbert, Synopsis, 510.

A single specimen of this rather rare darter was taken at Yellow Bank, in the canal, by Mr. Amos W. Butler, April 25, 1885. It is now

in the museum of the Indiana University and is, if I mistake not, the second—if not indeed the first—specimen of this species ever taken in Indiana. In the Transactions of the American Philosophical Society for 1871, pp. 212-213, Prof. Cope mentions a specimen in the Museum of the Philadelphia Academy "from the Miami River, in Indiana." This is, so far as I know, the only record from this state; and as the Miami River but barely touches Indiana at the south-east corner of the state, Prof. Cope's specimen was probably from south-western Ohio. At any rate the localities of the two specimens are not far apart, and careful search in either the White Water or Miami may add to our list other specimens of this interesting species.

31. *ETHEOSTOMA FLABELLARE* Rafinesque. (923).

Fan-tailed Darter.

Etheostoma flabellaris, Jordan, Man. Vert., 227.

Etheostoma flabellare, Jordan & Gilbert, Synopsis, 513.

Numerous specimens obtained from Little Cedar Creek.

32. *ETHEOSTOMA CERULEUM* Storer. (936).

Rainbow Darter.

Perciliichthys ceruleus, Jordan, Man. Vert., 226.

Jordan & Gilbert, Synopsis, 517.

With the preceding, common in Little Cedar Creek.

33. *STIZOSTEDION CANADENSE* (Smith). (949).

Sand Pike; "Salmon."

Stizostedion canadense, Jordan, Man. Vert., 230.

Stizostedion canadense, Jordan & Gilbert, Synopsis, 526.

"Several were taken last fall. One is still in the collection of the Society of Natural History which answers the description of this species." (Butler.)

34. *APLODINOTUS GRUNNIENS* Rafinesque. (1083).

Drum; Grunter; Thunder-Pumper; Gaspergou.

Haplodonotus grunniens, Jordan, Man. Vert., 250.

Jordan & Gilbert, Synopsis, 567.

"This fish was wholly unknown to our local anglers until within the last few years. It appeared since the destruction of the dams, and is but rarely taken even now." (Quick.)

35. *COTTUS RICHARDSONI* Agassiz. (1320).

Miller's Thumb; Little Star Gazer.

Umicottus richardsonii, Jordan, Man. Vert., 254.

Uranidea richardsoni, Jordan & Gilbert, Synopsis, 696.

A few specimens are in the collection from Little Cedar Creek.

A LIST OF THE BIRDS OBSERVED IN FRANKLIN COUNTY, INDIANA.

BY AMOS W. BUTLER.

The following list is believed to include all of the species of birds which have been identified within the present limits of Franklin County. Brief notes have been given with most of the species, in order that a better understanding of this paper may be had.

The first account of the birds of this region was published by Rufus Haysmond, M. D., in the *Proceedings of the Philadelphia Academy of Natural Sciences* for November, 1856. This list was entitled "Birds of Southwestern Indiana" and mentioned 139 species. The same author next published, in the First Annual Report of the Geological Survey of Indiana, 1869, a paper entitled "Birds of Franklin County, Indiana," which enumerated 164 species, including *Halictus washingtonii* and *Phalacrocorax carbo*. This list omitted nine species which were mentioned in the former paper, seven of which have since been ascertained to occur within our limits.

Mr. E. R. Quick and I contributed to the *Journal of the Cincinnati Society of Natural History*, from 1879 to 1881, many notes upon the birds of this County. In 1882 I prepared for Beers' Atlas of Franklin County, a list of the birds which had, at that time, been identified within the district under consideration. This article mentioned 123 species, two of which are omitted from this list. One of these, *Phalacrocorax carbo*, was doubtless wrongly identified by Dr. Haymond, and the position of the other, *Chen ceruleocephala*, is uncertain, it being generally considered a peculiar phase of coloration of *Chen hyperborea*.

Franklin County is situated in the south-eastern part of Indiana. Adjoining it on the north are the counties of Fayette and Union; on the west, Decatur and Rush; and on the south, Ripley and Dearborn. Its eastern boundary is the line between Ohio and Indiana. The White Water River, the East and West Forks of which unite at Brookville to form the river proper, traverse the County from north-west to south-east through a valley from 200 to 300 feet below the level of the surrounding country, then, crossing a corner of Dearborn County, enters Ohio and empties into the Big Miami River a short distance above its junction with

the Ohio River, near Lawrenceburg, Indiana. Away from the river valleys are the uplands which are comparatively level. The total area of woodland within the County is still very considerable. The absence of lakes and scarcity of ponds and marshes accounts for the absence of certain species of birds and for the rare occurrence of others. Even when one of the water-loving species is mentioned as "common" it is considered so but in comparison to other forms less frequently found. By reason of the varied topography here presented one is afforded some excellent lessons concerning the distribution of birds. Certain species are found abundantly upon the uplands and are very rare or wanting within the valleys; the converse also is true.

I desire to acknowledge my indebtedness for assistance rendered in preparing this list to Prof. J. A. Allen, of the American Museum of Natural History, New York, N. Y.; to Mr. Geo. N. Lawrence, New York, N. Y.; to Mr. Robert Ridgway, of the Smithsonian Institution, Washington, D. C., and to Mr. E. R. Quick and Rufus Haymond, M. D., Brookville, Indiana.

The nomenclature adopted in this list is that of the Code of Nomenclature and Check-List of North American Birds, adopted by the American Ornithologists' Union. Owing to the fact that this work has just been issued, I have taken the liberty of inserting the classification there adopted as fully as my limited space will permit.

Those species known to breed within the County are designated by an asterisk (*). The numbers in parenthesis following the names are those given in the new Code of Nomenclature before referred to. The dates added to summer and winter residents are intended to indicate the earliest and latest times at which they have been noted.

ORDER PYGPODES. DIVING BIRDS.

Suborder PODICIPEDES. Grebes.

FAMILY PODICIPIDÆ. GREBES.

GENUS COLYMBUS LINNÆUS.

Subgenus DYTES Kaup.

1. *Colymbus auritus* Linn. (3.) HORNED GREBE.

Rare migrant, April and May.

2. *Colymbus nigricollis californicus* (Heerm.). (4.) AMERICAN EARED GREBE.

A specimen of this species was shot by Mr. Edw. Hughes, four

miles north of Brookville, May 19, 1883. This is, perhaps, the furthest east that this form has been noted.

GENUS *PODILYMBUS* LESSON.

3. *Podilymbus podiceps* (Linn.). (6.) *PIED-BILLED GREBE*.

Very common migrant. This bird is locally termed "Didapper" "Dipper" and "Mud-hen." March, April and October.

Suborder *CEPHAL*. Loons and Auks.

FAMILY *URINATORIDÆ*. LOONS.

GENUS *URINATOR* CUVIER.

4. *Urinator imber* (Gunn.). (7.) *LOON*.

A regular migrant. April and October.

5. *Urinator lumme* (Gunn.). (11.) *RED-THROATED LOON*.

Rare winter visitor. A specimen of this species was shot near Brookville, February 23, 1885. I was told that four other loons were kept in its company when it was found. That morning the thermometer registered 10 degrees below zero, and for several days previous the weather was equally severe.

ORDER *LONGIPENNES*. LONG-WINGED SWIMMERS.

FAMILY *LARIDÆ*. GULLS, ETC.

Subfamily *LARINÆ*. Gulls.

GENUS *LARUS* LINNÆUS.

6. *Larus argentatus smithsonianus* Coues. (51a.) *AMERICAN HERRING GULL*.

Rather common winter visitor. Jan. 20, Mar. 21.

7. *Larus philadelphia* (Ord). (60.) *BONAPARTE'S GULL*.

Occasionally seen at the same season as the preceding species.

Subfamily *STERNINÆ*. Terns.

GENUS *STERNA* LINNÆUS.

Subgenus *STERNA*.

8. *Sterna hirundo* Linn. (70.) *COMMON TERN*.

Rare summer visitor. June 3, 1884.

9. *Sterna dougalli* Montag. (72.) *ROSEATE TERN*.

Sometimes seen. (Haymond, Ind. Geol., 1869, p. 235.)

ORDER STEGANOPODES. TOTIPALMATE SWIMMERS.

FAMILY PHALACROCORACIDÆ. CORMORANTS.

GENUS PHALACROCORAX BRISSON.

Subgenus PHALACROCORAX.

10. *Phalacrocorax dilophus* (Sw. & Rich.). (120.) DOUBLE-CRESTED CORMORANT.

Rare visitor. Nov. 19, 1880. (Jour. Cin. Soc. of Nat. Hist., Dec., 1881, p. 341.)

11. *Phalacrocorax dilophus floridanus* (Aud.). (120b.) FLORIDA CORMORANT.

Visitor in fall, winter and spring. Sometimes seen in flocks of ten to fifteen individuals.

FAMILY PELECANIDÆ. PELICANS.

GENUS PELECANUS LINNEUS.

Subgenus CYRTOPELICANUS Reichenbach.

12. *Pelecanus erythrorhynchos* (Gmel.). (125.) AMERICAN WHITE PELICAN.

Rare visitor. (Haymond, Ind. Geol., 1869, p. 234.)

ORDER ANSERES. LAMELLIROSTRAL SWIMMERS.

FAMILY ANATIDÆ. DUCKS, GEESE, ETC.

Subfamily MERGINÆ. Mergansers.

GENUS MERGANSER BRISSON.

13. *Merganser americanus* (Cass.). (129.) AMERICAN MERGANSER.
Winter resident; some winters common. October to April.

14. *Merganser serrator* (Linn.). (130.) RED-BREASTED MERGANSER.
Rare migrant. Aug., 1879; Mar. 21, 1883. (Quick.)

GENUS LOPHODYTES REICHENBACH.

15. *Lophodytes cucullatus* (Linn.). (131.) HOODED MERGANSER.
• Winter resident; sometimes common.

Subfamily ANATINÆ. River Ducks.

GENUS ANAS LINNEUS.

16. *Anas boschas* Linn. (132.) MALLARD.
Common migrant.

17. *Anas obscura* (Gmel.). (133.) BLACK DUCK.
Rare migrant. (Quick.)

List of Birds Observed in Franklin County, Ind.

Subgenus CHAULELASMUS Bonaparte.

18. *Anas strepera* Linn. (135.) GADWALL; GRAY DUCK.
Rare migrant. (*Quick.*)

Subgenus MARECA Stephens.

19. *Anas americana* Gmel. (137.) BALDPATE.
Rather common migrant.

Subgenus NETTION Kaup.

20. *Anas carolinensis* Gmel. (139.) GREEN-WINGED TEAL.
Common migrant.

Subgenus QUERQUEDULA Stephens.

21. *Anas discors* Linn. (140.) BLUE-WINGED TEAL.
Migrant; the most common of its family. October, April and May.

GENUS SPATULA BOIE.

22. *Spatula clypeata* (Linn.). (142.) SHOVELLER.
Rare migrant. (*Quick.*)

GENUS DAFILA STEPHENS.

23. *Dafila acuta* (Linn.). (143.) PINTAIL.
Common migrant.

GENUS AIX BOIE.

24. *Aix sponsa* (Linn.). (144.) WOOD DUCK.
Common migrant and rare summer resident. Mar. 26 to October.

GENUS AYTHYA BOIE.

25. *Aythya americana* (Eyt.). (146.) REDHEAD.
Uncommon migrant.
26. *Aythya vallisneria* (Wils.). (147.) CANVAS-BACK.
Rare migrant.

Subgenus FULIGULA Stephens.

27. *Aythya marila nearctica* Stejn. (148.) AMERICAN SCAMP DUCK.
Rare migrant. (Haymond, Ind. Geol., 1869, p. 233.)
28. *Aythya affinis* (Eyt.). (149.) LESSER SCAMP DUCK.
Migrant; more common than the last mentioned species.
29. *Aythya collaris* (Dum.). (150.) RING-NECKED DUCK.
Rare migrant. A specimen killed by Mr. Wm. M. McCleery, Mar. 8, 1894, is, through the kindness of Mr. E. R. Quick, in the collection of the Society of Natural History.

GENUS GLAUCIONETTA STEINEGER.

30. *Glaucionetta clangula americana* (Bonap.). (151.) AMERICAN GOLDEN-EYE.
Common migrant.

GENUS CHARITONETTA STEINEGER.

31. *Charitonetta albeola* (Linn.). (153.) BUFFLE-HEAD.
Common migrant.

GENUS OIDEMIA FLEMING.

Subgenus MELANITTA Boie.

32. *Oidemia deglandi* Bonap. (165.) WHITE-WINGED SCOTER.
Winter visitor. (Haymond, Ind. Geol., 1869, p. 233.)

GENUS ERISMATURA BONAPARTE.

33. *Erismatura rubida* (Wils.). (167.) RUDDY DUCK.
Rare migrant.

Subfamily ANSERINÆ. Geese.

GENUS CHEN BOIE.

34. *Chen hyperborea* (Pall.). (169.) LESSER SNOW GOOSE.
Rare migrant. Oct. 18, 1881. (*Quick.*) I am by no means certain that this is not var. *nevalis*. The specimen referred to is in the collection of the Society of Natural History.

GENUS BRANTA SCOPOLI.

35. *Branta canadensis* (Linn.). (172.) CANADA GOOSE.
Regular migrant, but never common.
36. *Branta bernicla* (Linn.). BRANT.
Rare migrant. (Haymond, Ind. Geol., 1869, p. 232.)

ORDER HERODIONES. HERONS, IBISES, ETC.

Suborder CICONIÆ. Storks, etc.

FAMILY CICONIIDÆ. STORKS AND WOOD IBISES.

Subfamily TANTALINÆ. Wood Ibises.

GENUS TANTALUS LINNEUS.

37. *Tantalus luculator* (Linn.). (188.) WOOD IBIS.

Formerly a rare visitor in summer. I quote the following from Dr. Haymond's *Birds of South-eastern Indiana*: "The first day of August, 1855, a large flock of these birds made their appearance in this neighborhood. They remained along the river and White Water canal for about a

month or six weeks. A son of one of my neighbors broke the wing of one of them and caught it. After keeping it three or four weeks, feeding it upon fish, he gave it to me. I kept it until near the first of November, when it fell a victim, as many another had done, to its appetite. Some mackerel had been placed to soak upon a table in the back yard, one of which he ate and ate, and upon the evening of the next day died in convulsions."

Suborder HERODII. Herons, Egrets, etc.

FAMILY ARDEIDÆ. HERONS, BITTERNS, ETC.

Subfamily BOTAURINÆ. Bitterns.

GENUS BOTAURUS HERMANN.

Subgenus BOTAURUS.

38. *Botaurus lentiginosus* (Montag.). (190.) AMERICAN BITTERN.
A regular migrant. Not common.

Subgenus ARDETTA Gray.

39. *Botaurus exilis* (Gmel.). (191.) LEAST BITTERN.
Rare migrant; two specimens. (Haymond, Ind. Geol., 1869, p. 228.)

Subfamily ARDEINÆ. Herons and Egrets.

GENUS ARDEA LINNÆUS.

Subgenus ARDEA.

40. *Ardea herodias* Linn. (194.) GREAT BLUE HERON.
Rather common migrant; seen also irregularly through the summer.
- Subgenus HERODIAS Boie.
41. *Ardea egretta* (Gmel.). (196.) AMERICAN EGRET.
Visitor in August, September and October. Some years they are common, others rare.

Subgenus GARZETTA Kaup.

42. *Ardea candidissima* (Gmel.). (197.) SNOWY HERON.
A rare visitor in August. (Quick.)

Subgenus BUTORIDES Blyth.

- *43. *Ardea virescens* Linn. (201.) GREEN HERON.
A common summer resident. April to October.

GENUS NYCTICORAX STEPHENS.

Subgenus NYCTICORAX.

44. *Nycticorax nycticorax nævius* (Bodd.). (202.) BLACK-CROWNED NIGHT HERON.
Migrant; not common. April and May.

ORDER PALUDICOLÆ. CRANES, RAILS, ETC.

Suborder GRUES. Cranes.

FAMILY GRUIDÆ. CRANES.

GENUS GRUS PALLAS.

45. *Grus mexicana* (Mull.). (206.) SANDHILL CRANE.

Rare visitor; three specimens. (Haymond, Ind. Geol., 1869, p. 228.)

Suborder RALLI. Rails, Gallinules, Coots, etc.

FAMILY RALLIDÆ. RAILS, GALLINULES, AND COOTS.

Subfamily RALLINÆ. Rails.

GENUS RALLUS LINNÆUS.

46. *Rallus elegans* Aud. (208.) KING RAIL.

Rare migrant. A specimen of this species was shot near Brookville April 20, 1881, and is now in the collection of Mr. J. E. Rehme, Connersville, Ind.

47. *Rallus virginianus* Linn. (212.) VIRGINIA RAIL.

Rare migrant.

GENUS PORZANA VIEILLOT.

Subgenus PORZANA.

48. *Porzana carolina* (Linn.). (214.) SORA.

A regular migrant; not common. April, May, September and October.

Subgenus COTURNICOPS Bonaparte.

49. *Porzana noveboracensis* (Gmel.). YELLOW RAIL.

Rare migrant. Two specimens were caught alive, in a swamp, by a farmer living about two miles from Brookville, in September, 1879.

Subfamily GALLINULINÆ. Gallinules.

GENUS IONORNIS REICHENBACH.

50. *Ionornis martinica* (Linn.). (218.) PURPLE GALLINULE.

Rare migrant. A specimen was killed near Brookville in the Spring of 1880.

GENUS GALLINULA BRISSON.

51. *Gallinula galeata* (Licht.). (219.) FLORIDA GALLINULE.

Rare Migrant. (Haymond, Ind. Geol., 1869, p. 231.)

Subfamily FULICINÆ. Coots.

GENUS FULICA LINNÆUS.

52. *Fulica americana* Gmel. (221.) AMERICAN COOT.

A common migrant. March, April and May.

ORDER LIMICOLÆ. SHORE BIRDS.

FAMILY SCOLOPACIDÆ. SNIPES, SANDPIPERS, ETC.

GENUS PHILOHÆLA GRAY.

- *53. *Philohela minor* (Gmel.). (228.) AMERICAN WOODCOCK.
Summer resident. March 21; Nov. 10.

GENUS GALLINAGO LEACH.

54. *Galinago delicata* (Ord.). (230.) WILSON'S SNIFE.
Migrant; common locally. March, April, May, Sept., Oct.

GENUS TRINGA LINNÆUS.

Subgenus ACTODROMAS KAUP.

55. *Tringa maculata* Vieill. (239.) PECTORAL SANDPIPER.
Migrant; some years common. March, April, May, September, and October.
56. *Tringa minutilla* Vieill. (242.) LEAST SANDPIPER.
Rare migrant in August. (*Quick*).

GENUS TOTANUS BECHSTEIN.

Subgenus GLOTTIS KOCH.

57. *Totanus melanoleucus* (Gmel.). (254.) GREATER YELLOW-LEGS.
Migrant; not common. April and May.
58. *Totanus flavipes* (Gmel.). (255.) YELLOW-LEGS.
Migrant; more common than the last named species. April and September.

Subgenus RHYACOPHILUS KAUP.

59. *Totanus solitarius* (Wils.). (256.) SOLITARY SANDPIPER.
Migrant; generally common in August and September.

GENUS SYMPHEMIA RAFINESQUE.

60. *Symphemia semipalmata* (Gmel.). (258.) WILLET.
Rare migrant. April 11, 1883, Sept., 1879. (Journ. Cin. Soc. Nat. Hist., July, 1880, p. 127.)

GENUS BARTRAMIA LESSON.

61. *Bartramia longicauda* (Bechst.). (261.) BARTRAMIAN SANDPIPER.
Rare migrant. (Haymond, Ind. Geol., 1869, p. 231.)

GENUS ACTITIS ILLIGER.

- *62. *Actitis macularia* (Linn.). (263.) SPOTTED SANDPIPER.
Common summer resident April 15 to September.

GENUS NUMENIUS BRISSON.

63. *Numenius longirostris* Wils. (264.) LONG-BILLED CURLEW.
Very rare migrant. (Haymond, Ind. Geol., 1869, p. 231.)

FAMILY CHARADRIIDÆ. PLOVERS.

GENUS CHARADRIUS LINNÆUS.

Subgenus CHARADRIUS.

64. *Charadrius dominicus* Mull. (272.) AMERICAN GOLDEN PLOVER.
Rare migrant in April.

GENUS ÆGIALITIS BOIE.

Subgenus OXYECHUS Reichenbach.

- *65. *Ægialitis vocifera* (Linn.). (273.) KILLDEER.
Common; during mild winters it remains with us.

FAMILY APHRIZIDÆ. SURF BIRDS AND TURNSTONES.

Subfamily ARENARIINÆ. Turnstones.

GENUS ARENARIA BRISSON.

66. *Arenaria interpres* (Linn.). (283.) TURNSTONE.
Rare migrant. (Haymond, Ind. Geol., 1869, p. 229.)

ORDER GALLINÆ. GALLINACEOUS BIRDS.

Suborder PHASIANI. Pheasants, Grouse, etc.

FAMILY TETRAONIDÆ. GROUSE, PARTRIDGES, ETC.

Subfamily PERDICINÆ. Partridges.

GENUS COLINUS LESSON.

- *67. *Colinus virginianus* (Linn.). (289.) BOB-WHITE.

Resident, but not nearly so common as formerly. Hard winters and still harder "pot-hunters" have almost exterminated these beautiful birds.

Subfamily TETRAONINÆ. Grouse.

GENUS BONASA STEPHENS.

- *68. *Bonasa umbellus* (Linn.). (300.) RUFFED GROUSE.

Resident; rather common in certain localities. Perhaps as numerous as they ever were.

FAMILY PHASIANIDÆ. PHEASANTS, ETC.

Subfamily MELEAGRINÆ. Turkeys.

GENUS MELEAGRIS LINNÆUS.

69. *Meleagris gallopavo* Linn. (310.) WILD TURKEY.

Formerly a common resident. None have been killed for six or eight years. (See Bull. Brookv. Soc. of Nat. Hist., No. 1, p. 12.)

ORDER COLUMBÆ. PIGEONS.

FAMILY COLUMBIDÆ. PIGEONS.

GENUS ECTOPISTES SWAINSON.

*70. *Ectopistes migratorius* (Linn.). (315.) PASSENGER PIGEON.

These birds are very irregular in their movements. At times they are resident throughout the year; again they are but migrants or summer or winter residents. They have been known to breed within the county. "Pigeon-roosts" were formerly known in this vicinity. But few of these birds are now seen compared with the great numbers which formerly appeared.

GENUS ZENAIDURA BONAPARTE.

*71. *Zenaidura macroura* (Linn.). (316.) MOURNING DOVE.

A common resident.

ORDER RAPTORES. BIRDS OF PREY.

Suborder SARCORHAMPHI. American Vultures.

FAMILY CATHARTIDÆ. AMERICAN VULTURES.

GENUS CATHARTES ILLIGER.

*72. *Cathartes aura* (Linn.). (325.) TURKEY VULTURE.

Common; some years when the winters are mild, they are resident. Never, even in the coldest winters, are they absent more than a few weeks.

GENUS CATHARISTA VIEILLOT.

73. *Catharista atrata* (Bartr.). (326.) BLACK VULTURE.

Winter and spring visitor; rare. December, February and April.

Suborder FALCONES. Vultures, Falcons, Hawks, etc.

FAMILY FALCONIDÆ. VULTURES, FALCONS, HAWKS, ETC.

Subfamily ACCIPITRINÆ. Kites, Buzzards, Eagles, etc.

GENUS ELANOIDES VIEILLOT.

74. *Elanoides forficatus* (Linn.). (327.) SWALLOW-TAILED KITE.

Rare summer visitor. A single specimen. (Haymond, Ind. Geol., 1869, p. 210.)

GENUS CIRCUS LACEPEDE.

75. *Circus hudsonius* (Linn.). (331.) MARSH HAWK.

A rare winter visitor.

GENUS ACCIPITER BRISSON.

Subgenus ACCIPITER.

- *76. *Accipiter velox* (Wils.). (332.) SHARP-SHINNED HAWK.

Common resident.

- *77. *Accipiter cooperi* (Bonap.). COOPER'S HAWK.

Common resident.

Subgenus ASTUR Lacepede.

78. *Accipiter atricapillus* (Wils.). (334.) AMERICAN GOSHAWK.

Rare winter visitor. Jan. 1881. (*Quick*.)

GENUS BUTEO CUVIER.

- *79. *Buteo borealis* (Gmel.). (337.) RED-TAILED HAWK.

Common resident.

80. *Buteo lineatus* (Gmel.). (339.) RED-SHOULDERED HAWK.

Resident; not common.

81. *Buteo latissimus* (Wils.). (343.) BROAD-WINGED HAWK.

Rare; probably resident.

GENUS ARCHIBUTEO BREHM.

82. *Archibuteo lagopus sancti-johannis* (Gmel.). (347a.) AMERICAN
ROUGH-LEGGED HAWK.

Rare visitor. (Haymond, Ind. Geol., 1869, p. 210.)

GENUS AQUILA BRISSON.

83. *Aquila chrysaetos* (Linn.). (349.) GOLDEN EAGLE.

Rare winter visitor, and perhaps winter resident. December, January and February.

GENUS HALIAETUS SAVIGNY.

84. *Haliaetus leucocephalus* (Linn.). (352.) BALD EAGLE.

Winter visitor, some winters winter resident. At times common.

Subfamily FALCONINÆ. Falcons.

GENUS FALCO LINNÆUS.

Subgenus FESALON Kaup.

85. *Falco columbarius* Linn. (357.) PIGEON HAWK.

Rare migrant. (Haymond, Ind. Geol., 1869, p. 209.)

Subgenus TINNUNCULUS Vieillot.

- *86. *Falco sparverius* Linn. (360.) AMERICAN SPARROW HAWK.
Very common resident.

Subfamily PANDIONINÆ. Ospreys.

GENUS PANDION SAVIGNY.

87. *Pandion haliaetus carolinensis* (Gmel.). (364.) AMERICAN OSPREY.
Regular migrant. Generally rather common in April.

Suborder STRIGES. Owls.

FAMILY STRIGIDÆ. BARN OWLS.

GENUS STRIX LINNÆUS.

88. *Strix pratincola* Bonap. (365.) AMERICAN BARN OWL.
A rare visitor. A specimen in my collection was shot Oct. 25, 1883.

FAMILY BUBONIDÆ. HORNED OWLS, ETC.

GENUS ASIO BRISSON.

89. *Asio wilsonianus* (Less). (366.) AMERICAN LONG-EARED OWL.
Irregular visitor in autumn, winter and spring.
90. *Asio accipitrinus* (Pall.). (367.) SHORT-EARED OWL.
Rare visitor. Nov. 8, 1878. (*Quick*.)

GENUS SYRNIUM SAVIGNY.

91. *Syrnium nebulosum* (Forst.). (368.) BARRED OWL.
Resident. Has decreased in numbers since the settlement of the country and is now rare.

GENUS NYCTALA BREHM.

92. *Nyctala acadica* (Gmel.). (372.) SAW-WHET OWL.
Visitor in winter and spring; rare.

GENUS MEGASCOPS KAUP.

- *93. *Megascops asio* (Linn.). (373.) SCREECH OWL.
A common resident. The gray form predominates in this vicinity.

GENUS BUBO CVIER.

- *94. *Bubo virginianus* (Gmel.). (375.) GREAT HORNED OWL.
Common resident. The most numerous of the larger owls.

GENUS NYCTEA STEPHENS.

95. *Nyctea nyctea* (Linn.). (376.) SNOWY OWL.
Rare winter visitor. A specimen taken in January 1881, is in the collection of Mr. E. R. Quick.

GENUS *SURNIA* DUMERIL.

96. *Surnia ulula caparoch* (Mull.). (377a.) AMERICAN HAWK OWL.
A rare winter visitor. Jan., 1878. (*Quick*.)

ORDER PSITTACI. PARROTS, MACAWS, ETC.

FAMILY PSITTACIDÆ.

GENUS *CONURUS* KÜHL.

97. *Conurus carolinensis* (Linn.). (382.) CAROLINA PAROQUET.

Formerly common. The older people speak of their abundance and of their habits. They were last seen in this vicinity about 1828. "This bird was formerly very numerous along White Water River." (Haymond, Proc. Phila. Acad. Nat. Sci., 1856, p. 293. See also Bull. Brookville Soc. Nat. Hist., No. 1, p. 12.)

ORDER COCCYGES. CUCKOOS, ETC.

Suborder CUCULI. Cuckoos, etc.

FAMILY CUCULIDÆ. CUCKOOS, ANIS, ETC.

Subfamily COCCYGINÆ. American Cuckoos.

GENUS *COCCYZUS* VIEILL.

98. *Coccyzus americanus* (Linn.). (387.) YELLOW-BILLED CUCKOO.

Summer resident, very common. May 5; Oct. 10.

99. *Coccyzus erythrophthalmus* (Wils.). (388.) BLACK-BILLED CUCKOO.

Common migrant and also summer resident. Both species are known by the name "Rain Crow."

Suborder ALCYONES. Kingfishers.

FAMILY ALCEDINIDÆ. KINGFISHERS.

GENUS *CERYLE* BOIE.

Subgenus STREPTOCERYLE Bonaparte.

100. *Ceryle alcyon* (Linn.). (390.) BELTED KINGFISHER.

Common resident.

ORDER PICI. WOODPECKERS, WRYNECKS, ETC.

FAMILY PICIDÆ. WOODPECKERS.

GENUS *CAMPEPHILUS* GRAY.

101. *Campephilus principalis* (Linn.). (392.) IVORY-BILLED WOODPECKER.

Formerly found within our limits. In the eastern part of the county,

at the time of its settlement, were swamps in which grew heavy timber. In these localities, this fine woodpecker was found about sixty years ago (Haymond, Ind. Geol., 1890, p. 111, cf. Bull. Brooklyn Soc. Nat. Hist., No. 1, p. 11.)

GENUS DRYOBATES BOIE.

- *102. *Dryobates villosus* (Linn.). (393.) Hairy Woodpecker.

A common resident.

- *103. *Dryobates pubescens* (Linn.). (394.) Downy Woodpecker.

Abundant resident; much more numerous than the last named species.

GENUS SPHYRAPICUS BAIRD.

104. *Sphyrapicus varius* (Linn.). (402.) Yellow-bellied Sapsucker.

Winter resident. First seen in May 1. — June, 1894. (Quail.) They vary greatly in numbers in different years and are generally quite common in October and April.

GENUS CEOPHLOEUS CABANIS.

105. *Ceophloeus pileatus* (Linn.). (405.) Pileated Woodpecker.

Formerly a very common resident. Known as "Woodcock," and "Logcock." It is doubtless now extinct within this county.

GENUS MELANERPES SWAINSON.

Subgenus MELANERPES.

- *106. *Melanerpes erythrocephalus* (Linn.). (406.) Red-headed Woodpecker.

Common from February to November, and occasionally resident throughout the year.

Subgenus CENTRUS SWAINSON.

- *107. *Melanerpes carolinus* (Linn.). (409.) Red-bellied Woodpecker.

Common resident. Frequents the uplands, appearing to prefer oak woods.

GENUS COLAPTES SWAINSON.

- *108. *Colaptes auratus* (Linn.). (412.) Flicker: "Yellow-hammer."

Abundant resident.

ORDER MACROCHIRIS. GOATSUCKERS, SWIFTS, ETC.

Suborder CAPRIMULGI. Goatsuckers, etc.

FAMILY CAPRIMULGIDÆ. GOATSUCKERS, ETC.

GENUS ANTROSTOMUS GOULD.

- *109. *Antrostomus vociferus* (Wils.). (417.) Whip-poor-will.

Summer resident. Common locally. April to September.

GENUS CHORDEILES SWAINSON.

110. *Chordeiles virginianus* (Gmel.). (420.) NIGHTHAWK.
Rather common migrant. May and September.

Suborder CYPSELL. Swifts.

FAMILY MICROPODIDÆ. SWIFTS.

Subfamily CHÆTURINÆ. Spine-tailed Swifts.

GENUS CHÆTURA STEPHENS.

111. *Chætura pelagica* (Linn.). (423.) CHIMNEY SWIFT.
Abundant summer resident. Apr. 1; Oct. 6.

Suborder TROCHILI. Hummingbirds.

FAMILY TROCHILIDÆ. HUMMINGBIRDS.

GENUS TROCHILUS LINNÆUS.

Subgenus TROCHILUS.

112. *Trochilus colubris* Linn. (428.) RUBY-THROATED HUMMINGBIRD.
Common summer resident. Apr. 26; Sept. 23.

ORDER PASSERES. PERCHING BIRDS.

Suborder CLAMATORES. Songless Perching Birds.

FAMILY TYRANNIDÆ. TYRANT FLYCATCHERS.

GENUS TYRANNUS CUVIER.

113. *Tyrannus tyrannus* (Linn.). (441.) KINGBIRD.
Common summer resident. Middle of April to September.

GENUS MYIARCHUS CABANIS.

114. *Myiarchus crinitus* (Linn.). (452.) CRESTED FLYCATCHER.
Common summer resident; arriving some years by Apr. 20.

GENUS SAYORNIS BONAPARTE.

115. *Sayornis phœbe* (Lath.). (456.) PHOEBE; "PEWEE."
Summer resident; abundant. Mar. 1; Sep. 28. They are sometimes found nesting in March.

GENUS CONTOPUS CABANIS.

116. *Contopus virens* (Linn.). (461.) WOOD PEWEE.

Summer resident, probably more abundant than the last mentioned species. May 1; Sept. 5.

GENUS EMPIDONAX CABANIS.

117. *Empidonax flaviventris* Baird. (463.) YELLOW-BELLIED FLYCATCHER.

Migrant. May and September.

- *118. *Empidonax acadicus* (Aud.). (465.) ACADIAN FLYCATCHER.

Common migrant and rare resident. Arrive first week in May.

119. *Empidonax pusillus traillii* (Aud.). (466a.) TRAILL'S FLYCATCHER.

Rare migrant. (Haymond, Ind. Geol., 1869, p. 214.)

120. *Empidonax minimus* Bosc. (467.) ELIOT FLYCATCHER.

Migrant; some years rather common. May and September.

Suborder OSCINES. Song Birds.

FAMILY ALAUDIDÆ. LARKS.

GENUS OTOCORIS BONAPARTE.

121. *Otocoris alpestris praticola* Hensh. (474b.) PRAIRIE HOBWING LARK.

Winter visitor. Some winters they are here but a few days, others they are common from November to late in February. Nov. 14; Feb. 27.

FAMILY CORVIDÆ. CROWS, JAYS, ETC.

Subfamily GARRULINÆ. Magpies and Jays.

GENUS CYANOCITTA STRICKLAND.

- *122. *Cyanocitta cristata* (Linn.). (477.) BLUE JAY.

A common resident.

Subfamily CORVINÆ. Crows.

GENUS CORVUS LINNEUS.

123. *Corvus corax sinuatus* (Wagl.). (486.) AMERICAN RAVEN.

Once common. None have been seen for about eighteen years. Bull. Brookv. Soc. Nat. Hist., No. 1, p. 11.)

- *124. *Corvus americanus* Aud. (488.) AMERICAN CROW.

Abundant resident.

FAMILY ICTERIDÆ. BLACKBIRDS, ORIOLES, ETC.

GENUS DOLICHONYX SWAINSON.

125. *Dolichonyx oryzivorus* (Linn.). (491.) BOBOLINK.

Rare migrant in May and June.

GENUS MOLOTHRUS SWAINSON.

- *126 *Molothrus ater* (Bodd.). (495.) COWBIRD.

Abundant summer resident. Mar. 21; Oct. 30.

GENUS AGELAIUS Vieillot.

- *127. *Agelaius phoeniceus* (Linn.). (498.) RED-WINGED BLACKBIRD.

Summer resident; not common. More numerous during their migrations. Arrive some years Feb. 25.

GENUS STURNELLA Vieillot.

- *128. *Sturnella magna* (Linn.). (501.) MEADOWLARK.

Common; irregularly resident. During mild winters they remain with us.

GENUS ICTERUS Brisson.

Subgenus PENDULINUS Vieillot.

- *129. *Icterus spurius* (Linn.). (506.) ORCHARD ORIOLE.

Common summer resident, arriving some years April 25.

Subgenus YPHANTES Vieillot.

- *130. *Icterus galbula* (Linn.). (507.) BALTIMORE ORIOLE.

Summer resident; arriving occasionally Apr. 23. Most abundant along streams.

GENUS SCOLECOPHAGUS Swainson.

- *131. *Scolecophagus carolinus* (Mull.). (509.) RUSTY BLACKBIRD.

Migrant; not common. March and November.

GENUS QUISCALUS Vieillot.

Subgenus QUISCALUS.

- *132. *Quiscalus quiscula æneus* (Ridg.). (511b.) BRONZED GRACKLE.

Common summer and rare winter resident. Feb. 17; Nov. 14. One remained during the winter of 1879-80, keeping company with a flock of English sparrows. (Journ. Cin. Soc. Nat. Hist., July 1880, p. 125.) After rearing their young the greater number go north returning in September.

FAMILY FRINGILLIDÆ. FINCHES, SPARROWS, ETC.

GENUS CARPODACUS Kaup.

- *133. *Carpodacus purpureus* (Gmel.). (517.) PURPLE FINCH.

Migrant; generally common in April, feeding on elm buds.

GENUS LOXIA LINNÆUS.

- *134. *Loxia curvirostra minor* (Brehm.). (521.) AMERICAN CROSSBILL.

Irregular visitor in winter and spring. Mar. 15 to Apr. 5, 1883.

GENUS ACANTHIS Bechstein.

- *135. *Acanthis linaria* (Linn.). (528.) REDPOLL.

A rare winter visitor. Mr. C. R. Case reported them in flocks Feb. 10, 1881.

GENUS SPINUS KOCH.

- *136. *Spinus tristis* (Linn.). (529.) AMERICAN GOLDFINCH.

Equally abundant at all seasons of the year. Those which winter here, in a great measure, pass northward to breed, being replaced by others from the south.

137. *Spinus pinus* (Wils.). (533.) PINE SISKIN; "PINE FINCH."

Irregular visitor in winter and spring. Some years none are seen, others they are exceedingly abundant. During the winter of 1882-3 they were present in great numbers from Nov. 17 to Apr. 27. The winter of 1884-5 none were seen, but in May, 1885, they were observed, in some numbers, feeding upon the buds of elms.

GENUS PLECTROPHENAX STEINER.

138. *Plectrophenax nivalis* (Linn.). (531.) SNOWFLAKE.

Rare winter visitor; observed by Mr. C. R. Case in December 1883. Also identified by Dr. Haymond. (Ind. Geol., 1869, p. 222.)

GENUS POOCÆTES BAIRD.

- *139. *Poocætes gramineus* (Amel.). (540.) VESPER SPARROW (YELLOW-WINGED BUNTING.)

A common summer resident. Feb. 15; Sept. 28.

GENUS AMMODRAMUS SWAINSON.

140. *Ammodramus sandwichensis savanna* (Wils.). (542a.) SAVANNA SPARROW.

Migrant; rather common on uplands in April and October.

Subgenus COTURNICULUS BONAPARTE.

- *141. *Ammodramus savannarum passerinus* (Wils.). (546.) GRASS HOPPER SPARROW; "YELLOW-WINGED SPARROW."

Summer resident; April 27 to late in September. Very common on uplands but rare in the valleys.

142. *Ammodramus lecontei* (Aud.). (548.) LECONTE'S SPARROW.

Accidental, or perhaps rare migrant. A specimen of this bird was taken by me Mar. 12, 1884.

GENUS CHONDESTES SWAINSON.

- *143. *Chondestes grammacus* (Say). (552.) LARK SPARROW.

Summer resident; not common. Appear some years Apr. 10.

GENUS ZONOTRICHIA SWAINSON.

144. *Zonotrichia leucophrys* (Forst.). (554.) WHITE-CROWNED SPARROW.

Common migrant late in April, early in May and October.

145. *Zonotrichia albicollis* (Gmel.). (558.) WHITE-THROATED SPARROW.

Abundant migrant. March, April, October and November.

GENUS SPIZELLA BONAPARTE.

146. *Spizella monticola* (Gmel.). (559.) TREE SPARROW.

Common winter resident. Oct. 10; Apr. 9.

147. *Spizella socialis* (Wils.). (560.) CHIPPING SPARROW.

Common summer resident. Mar. 20; Sept. 28.

148. *Spizella pusilla* (Wils.). (563.) FIELD SPARROW.

Common summer resident. Mar. 8; Oct. 6.

GENUS JUNCO WAGLER.

149. *Junco hyemalis* (Linn.). (567.) SLATE-COLORED JUNCO.

Abundant winter resident. Oct 8; April 25.

GENUS MELOSPIZA BAIRD.

150. *Melospiza fasciata* (Gmel.). (581.) SONG SPARROW.

Abundant resident.

151. *Melospiza lincolni* (Aud.). (583.) LINCOLN'S SPARROW.

Rare migrant. May; October.

152. *Melospiza georgiana* (Luth.). (584.) SWAMP SPARROW.

Migrant: not common. Apr.; Sept.

GENUS PASSERELLA SWAINSON.

153. *Passerella iliaca* (Merr.). (585.) FOX SPARROW.

Common migrant in Feb., Mar., Apr., Oct. and Nov.

GENUS PIPILO VIEILLLOT.

154. *Pipilo erythrophthalmus* (Linn.). (587.) TOWHEE.

Common resident.

GENUS CARDINALIS BONAPARTE.

155. *Cardinalis cardinalis* (Linn.). (593.) CARDINAL.

Common resident.

GENUS HABIA REICHENBACH.

156. *Habia ludoviciana* (Linn.). (595.) ROSE-BREASTED GROSBEAR.

Migrant, and perhaps rare summer resident. Some years rare; others more common. April, May, September; "June and August." (Haymond, Ind. Geol., 1869, p. 223.)

GENUS PASSERINA VIEILLLOT.

157. *Passerina cyanea* (Linn.). (598.) INDIGO BUNTING.

Abundant summer resident. Apr. 22; Sept. 14.

GENUS SPIZA BONAPARTE.

- *158. *Spiza americana* (Linn.). (604.) DICKCISSEL: "BLACK-THROATED BLUE."
 "BIRDIE."

Common summer resident on the uplands, rare in the valleys. Occasionally arrives Apr. 30.

GENUS PASSER BRISSON.

- *159. *Passer domestica* (Linn.). HOUSE SPARROW: ENGLISH SPARE.
 Very abundant and unwelcome resident. First observed in this vicinity in 1878.

FAMILY TANAGRIDÆ. TANAGERS.

GENUS PIRANGA VIEILLIOT.

- *160. *Piranga erythromelas* Vieill. (608.) SCARLET TANAGER.
 Common summer resident. Apr. 22; Sept. 11.

- *161. *Piranga rubra* (Linn.). (610.) SUMMER TANAGER.

Summer resident; rather common on uplands, rare in the valleys. Arrive about May 15.

FAMILY HIRUNDINIDÆ. SWALLOWS.

GENUS PROGNE BOIE.

- *162. *Progne subis* (Linn.). (611.) PURPLE MARTIN.

Summer resident. Formerly very abundant. Most of their nesting sites are annually taken possession of by English sparrows. Upon the return of the martins several days of fighting ensues which invariably end with the sparrows masters of the field; the martins leaving for more congenial homes. Mar. 27; Aug. 31.

GENUS PETROCHELIDON CABANIS.

- *163. *Petrochelidon lunifrons* (Say). (612.) CLIFF SWALLOW; "EAVE SWALLOW."

Summer resident; locally common on the uplands, rare in the valleys. These swallows have been known to select a location in the valley but were unable to build nests out of the sandy mud they were compelled to use. After several trials they left, doubtless for a home whose surroundings were better adapted to their requirements. They generally arrive by the middle of April.

GENUS CHELIDON FORSTER.

- *164. *Chelidon erythrogaster* (Bodl.). (613.) BARN SWALLOW.
 A common summer resident. Mar. 30; Oct. 18.

GENUS TACHYCINETA CABANIS.

165. *Tachycineta bicolor* (Vieill.). (614.) TREE SWALLOW; "WHITE-BELLIED SWALLOW."

Migrant in April, May and September. "June, 1884." (Quick.)

GENUS CLIVICOLA FORSTER.

166. *Clivicola riparia* (Linn.). (616.) BANK SWALLOW.

Common summer resident along our streams. Generally arrive the first week in April and depart the first week in September. Mr. Quick reports seeing this or the next species Oct. 18, 1880. (Journ. Cin. Soc. Nat. Hist., Oct. 1882, p. 192.)

GENUS STELGIDOPTERYX BAIRD.

167. *Stelgidopteryx serripennis* (Aud.). (617). ROUGH-WINGED SWALLOW.

Summer resident; as common as the last mentioned species with which it arrives and departs.

FAMILY AMPELIDÆ. WAXWINGS, ETC.

Subfamily AMPELINÆ. Waxwings.

GENUS AMPELIS LINNÆUS.

168. *Ampelis cedrorum* (Vieill.). (619). CEDAR WAXWING.

Common resident.

FAMILY LANIIDÆ. SHRIKES.

GENUS LANIUS LINNÆUS.

169. *Lanius borealis* Vieill. (621). NORTHERN SHRIKE.

Winter visitor; occasionally winter resident; not common. Nov. 25; March 14.

170. *Lanius ludovicianus* Linn. (622). LOGGERHEAD SHRIKE.

Rare summer resident; sometimes arrives by March 25.

FAMILY VIREONIDÆ. VIREOS.

GENUS VIREO VIELLOT.

Subgenus VIREOSYLVA BONAPARTE.

171. *Vireo olivaceus* (Linn.). (624). RED-EYED VIREO.

Common summer resident. April 25; Sept. 28.

172. *Vireo philadelphicus* (Cass.). (626). PHILADELPHIA VIREO.

Migrant late in May and late in September; not common.

173. *Vireo gilvus* (Vieill.). (627). WARBLING VIREO.

Common summer resident, arriving some years by April 19.

Subgenus LANIVIREO BAIRD.

174. *Vireo flavifrons* Vieill. (628). YELLOW-THROATED VIREO.

Common migrant, April, May, August and September. Perhaps a rare summer resident.

175. *Vireo solitarius* (Wils.). (629). BLUE-HEADED VIREO.

Migrant; sometimes common in May.

Subgenus VIREO Vieillot.

- *176. *Vireo noveboracensis* (Gmel.). (631). WHITE-EYED VIREO.

Summer resident, not common. Arrives late in April and leaves early in September.

FAMILY MNIOTILTIDÆ. WOOD-WARBLERS.

GENUS MNIOTILTA VIEILLOT.

- *177. *Mniotilta varia* (Linn.). (636). BLACK AND WHITE WARBLER.

Summer resident; rather common. Arrives sometimes by April.

GENUS HELMITHIERUS RAFINESQUE.

- *178. *Helmitherus vermivorus* (Gmel.). (639). WORM-EATING WARBLER.

Very common summer resident in woods containing undergrowth. Most abundant on wooded hillsides. With the exception of the Orange-bird (*S. auricapillus*), this is the most common warbler of our woodlands April 25 to Sept. 3. Mr. E. R. Quick described a nest and eggs taken near here in 1882 in the Journal of the Cincinnati Society of Natural History for 1882.

GENUS HELMINTHIOPHILA RIDGWAY.

- *179. *Helminthophila pinus* (Linn.). (641). BLUE-WINGED WARBLER.

Summer resident, locally rather common. Sometimes arrives by April 23.

180. *Helminthophila olivacea* (Linn.). (642). GOLDEN-WINGED WARBLER.

Migrant; sometimes rather common last week in April and first week in May. Has not been recorded in autumn.

181. *Helminthophila ruficapilla* (Wils.). (645). NASHVILLE WARBLER.

Common migrant. April, May and September.

182. *Helminthophila celata* (Say). (646). ORANGE-CROWNED WARBLER.

Rare migrant in spring. April 29, 1880, (Quick, Jour. Cin. Soc. Nat. Hist., July 1889, p. 123), May 9, 1885.

183. *Helminthophila peregrina* (Wils.). (647). TENNESSEE WARBLER.

Migrant; rare in spring, rather common in autumn. April, May, September and October.

GENUS COMPSOTHTYLPIS CABANIS.

184. *Compsothlypis americana* (Linn.). (648). PARULA WARBLER.

Rather common migrant in spring. April 25 to May 16.

GENUS DENDROICA GRAY.

Subgenus PERISSOGLOSSA Baird.

185. *Dendroica tigrina* (Gmel.). (650). CAPE MAY WARBLER.

Rare migrant in spring. May 3 and 11, 1881.

Subgenus DENDROICA GRAY.

- *186. *Dendroica aestiva* (Gmel.). (652). YELLOW WARBLER.

A common summer resident; occasionally arriving by April 16.

187. *Dendroica caerulescens* (Gmel.). (654). BLACK-THROATED BLUE WARBLER.

Migrant; rather common in oak woods. April, May and Sept.

188. *Dendroica coronata* (Linn.). (655). MYRTLE WARBLER.

Abundant migrant. February 22 to May 10, and October.

189. *Dendroica maculosa* (Gmel.). (657). MAUDSLI WARBLER.

Uncommon migrant in May and September.

- *190. *Dendroica caerulea* (Wils.). (658). CERULEAN WARBLER.

Common summer resident, occasionally arriving by April 24.

191. *Dendroica pennsylvanica* (Linn.). (659). CHESTNUT-SIDED WARBLER.

Common migrant. May, August and September.

192. *Dendroica castanea* (Wils.). (660). BAY-BREASTED WARBLER.

Rare migrant. May and September.

193. *Dendroica striata* (Forst.). (661). BLACK-POLE WARBLER.

Migrant; not common. May and September.

194. *Dendroica blackburnii* (Gmel.). (662). BLACKBURNIAN WARBLER.

Common migrant. May, August and September.

- *195. *Dendroica dominica albilora* Baird. (663a). SYCAMORE WARBLER.

A common summer resident along all our streams. They are rarely seen on the uplands. Apr. 3; Sept. 25.

196. *Dendroica virens* (Gmel.). (667). BLACK-THROATED GREEN WARBLER.

Abundant migrant. April, May, September and October.

197. *Dendroica vigorsii* (Aud.). (671). PINE WARBLER.

Rare migrant late in April and early in October, frequenting maple woods.

198. *Dendroica palmarum* (Gmel.). (672). PALM WARBLER.

Migrant, more common in fall. April and September.

GENUS SEIURUS SWAINSON.

- *199. *Seiurus aurocapillus* (Linn.). (674). OVEN-BIRD.

Very abundant summer resident. Apr. 14; Sept. 21.

200. *Seiurus noveboracensis* (Gmel.). (675). WATER-THRUSH.

Regular migrant; not common. April, May and September.

- *201. *Seiurus motacilla* (Linn.). (676). LODESTAR WATER-THRUSH.

Summer resident, found about all the smaller streams in woodland. When these birds arrive they are paired and generally the female is ready for ovipositing. Apr. 21; Sept. 21.

GENUS GEOTHLYPIS CABANIS.

Subgenus OPORORNIS Baird.

202. *Geothlypis formosa* (Wils.). (677). KENTUCKY WARBLER.

Rare summer resident. Generally arrive first week in May.

203. *Geothlypis agilis* (Wils.). (678). CONNECTICUT WARBLER.

Irregular migrant in spring. Common late in May, 1882. The last of the warblers to arrive in spring.

Subgenus GEOTHLYPIS Cabanis.

204. *Geothlypis philadelphia* (Wils.). (679). MOURNING WARBLER.

Rare migrant. One specimen May 7, 1881.

- *205. *Geothlypis trichas* (Linn.). (681). MARYLAND YELLOW-THROAT.

Summer resident; locally common. Apr. 18; Sept. 10.

GENUS ICTERIA VIEILLLOT.

- *206. *Icteria virens* (Linn.). (683). YELLOW-BREASTED CHAT.

Common summer resident. Apr. 27 to October. Occasionally remains till early winter. Dec. 1, 1882.

GENUS SYLVANIA NUTTALL.

- *207. *Sylvania mitrata* (Gmel.). (684). HOODED WARBLER.

Rather common migrant. April, May and October. Rare summer resident. (Haymond).

208. *Sylvania pusilla* (Wils.). (685). WILSON'S WARBLER.

Migrant in autumn; not common. September.

209. *Sylvania canadensis* (Linn.). (686). CANADIAN WARBLER.

Regular migrant; not common. May; September.

GENUS SETOPHAGA SWAINSON.

- *210. *Setophaga ruticilla* (Linn.). (687). AMERICAN REDSTART.

Abundant summer resident. Apr. 18; Sept. 21.

FAMILY MOTACILLIDÆ. WAGTAILS.

GENUS ANTHUS BECHSTEIN.

Subgenus ANTHUS.

211. *Anthus pennsylvanicus* (Lath.). (697). AMERICAN PIPIT.
Abundant migrant. March, April and November.

FAMILY TROGLODYTIDÆ. WRENS, THRASHERS, ETC.

Subfamily MIMINÆ. Thrashers.

GENUS MIMUS BOIE.

- *212. *Mimus polyglottos* (Linn.). (703). MOCKINGBIRD.
Rare summer resident. I took young, able to fly but a few yards,
June 29, 1880.

GENUS GALEOSOPTES CABANIS.

- *213. *Galeoscoptes carolinensis* (Linn.). (704). CATBIRD.
Abundant summer resident. Apr. 16; Oct. 4.

GENUS HARPORHYNCHUS CABANIS.

Subgenus METHRIOPTERUS Reichenbach.

- *214. *Harporhynchus rufus* (Linn.). (705). BROWN THRASHER.
Common summer resident. March 31, September 11.

Subfamily TROGLODYTINÆ. Wrens.

GENUS THRYOTHORUS VIEILLOT.

Subgenus THRYOTHORUS.

- *215. *Thryothorus ludovicianus* (Lath.). (718). CAROLINA WREN.
Common resident. Has been found breeding from April 1 to early
in December.

Subgenus THRYOMANES Schater.

- *216. *Thryothorus bewickii* (Aud.). (719). BEWICK'S WREN.
A summer resident, not common; generally distributed over the
county. Occasionally arrives by April 6.

GENUS TROGLODYTES VIEILLOT.

Subgenus TROGLODYTES.

217. *Troglodytes aedon* Vieill. (721). HOUSE WREN.
Rare visitor. April 28, 1883. Breeds at Connersville, about nine
miles north of the northern limit of Franklin County.

Subgenus ANORTHURA Rennie.

218. *Troglodytes hiemalis* Vieill. (722). WINTER WREN.
Winter resident, more common in spring and fall. Oct. 8; Apr. 16.

GENUS CISTOTHORUS CABANIS.

Subgenus CISTOTHORUS.

219. *Cistothorus stellaris* (Licht.). (724). SHORT-BILLED MARSH WREN.
Rare migrant in September.

Subgenus TELMATODYTES CABANIS.

220. *Cistothorus palustris* (Wils.). (725). LONG-BILLED MARSH WREN.

Rare migrant in May.

FAMILY CERTHIDÆ. CREEPERS.

GENUS CERTHIA LINNÆUS.

221. *Certhia familiaris americana* (Bonap.). (726). BROWN CREEPER.
Common migrant and rare winter resident. Oct. 1; Apr. 19.

FAMILY PARIDÆ. NUTHATCHES AND TITS.

Subfamily SITTINÆ. Nuthatches.

GENUS SITTA LINNÆUS.

- *222. *Sitta carolinensis* Lath. (727). WHITE-BREASTED NUTHATCH.
Common resident.

223. *Sitta canadensis* Linn. (728). RED-BREASTED NUTHATCH.
Migrant in May; some years common.

Subfamily PARINÆ. Titmice.

GENUS PARUS LINNÆUS.

Subgenus LOPHOPHANES KAUPE.

- *224. *Parus bicolor* Linn. (731). TUFTED TITMOUSE.
Common resident.

Subgenus PARUS LINNÆUS.

- *225. *Parus carolinensis* Aud. (736). CAROLINA CHICKADEE.
Common resident.

FAMILY SYLVIIDÆ. WARBLERS, KINGLETS, GNATCATCHERS.

Subfamily REGULINÆ. Kinglets.

GENUS REGULUS CUVIER.

226. *Regulus satrapa* Licht. (748). GOLDEN-CROWNED KINGLET.
Common migrant and rare winter resident. October, November,
March and April.

227. *Regulus calendula* (Linn.). (749). RUBY-CROWNED KINGLET.

Migrant; not so common as the last mentioned species. October, April and May.

Subfamily POLIOPTILINÆ. Gnatcatchers.

GENUS POLIOPTILA SCLATER.

***228. *Polioptila cærulea* (Linn.). (751). BLUE-GRAY GNATCATCHER.**

Common summer resident, arriving generally about April 15. Mar. 31, 1884.

FAMILY TURDIDÆ. THRUSHES, BLUEBIRDS, ETC.

Subfamily TURDINÆ. Thrushes.

GENUS TURDUS LINNÆUS.

Subgenus HYLOCICHLA Baird.

***229. *Turdus mustelinus* (Gmel.). (755). WOOD THRUSH.**

Common summer resident; arrives sometimes Apr. 20.

230. *Turdus fuscescens* Steph. (756). WILSON'S THRUSH.

Rare migrant in May. (*Quick*).

231. *Turdus aliciae* Baird. (757). GRAY-CHEEKED THRUSH.

Rare migrant.

232. *Turdus ustulatus swainsonii* (Cab.). (758a). OLIVE-BACKED THRUSH.

Common migrant; April, May, September and October.

233. *Turdus aonalaschkæ pallasii* (Cab.). (759b). HERMIT THRUSH.

Migrant; not common. April and October.

GENUS MERULA LEACH.

***234. *Merula migratoria* (Linn.). (761). AMERICAN ROBIN.**

Very abundant resident from early in February to late in October. Perhaps occasionally remains through the winter. Jan. 18, 1884.

GENUS SIALIA SWAINSON.

***235. *Sialia sialis* (Linn.). (766.) BLUEBIRD.**

Irregularly resident. During severe winters they leave for a few weeks, but when the winters are milder they are present throughout the year.

BROOKVILLE, IND. March 15, 1886.

PRELIMINARY LIST OF REPTILES AND BATRACHIANS OF FRANKLIN COUNTY.

BY EDWARD HUGHES.

In presenting the following list of reptiles and batrachians, I do not pretend to give all the species that may occur in the county, but as the title implies, a start or foundation upon which to work in the future. It is our purpose to revise this list each year and add to it any species and named in it that is found in the county.

No one having made a special study of the lower vertebrates in this section, I have found it exceedingly difficult to obtain notes or specimens suitable to my purpose. Messrs. A. W. Butler and E. K. Quick have done something in this line, however, and to them I am indebted for some very valuable notes and specimens.

Nothing will be given in this list except those species known to have been taken in the county.

REPTILIA.

ORDER TESTUDINATA. (THE TURTLES.)

FAMILY EMYDIDÆ. (THE POND TURTLES.)

CISTUDO FLEMING. BOX TURTLES.

C. carolina *Linnaeus*. COMMON BOX TURTLE.

This species is quite common in the county. It is mostly found in dry, dense woods. Terrestrial.

CHRYSEMYIS GRAY. PAINTED TURTLES.

C. picta (*Herm.*) *Agassiz*. PAINTED TURTLE; MUD TURTLE.

Common, very pretty.

C. marginata *Agassiz*.

Not common in the county.

MALACOCLEMMYS GRAY. MARSH TURTLES.

M. lesueuri (*Gray*) *True*. LESUEUR'S MAP TURTLE.

I have only seen one specimen of this turtle from our county. It was taken by A. W. Butler in 1884 and donated to the Society of Natural History.

FAMILY CINOSTERNIDÆ. (THE CINOSTERNOID TURTLES.)

AROMOCHELYS GRAY. MUSK TURTLES.

A. odoratus (Latreille) Gray. MUSK TURTLE; STINK-POT.

Not common, but occasionally met with in the county.

FAMILY CHELYDRIDÆ. (THE SNAPPING TURTLES.)

CHELYDRA SCHWEIGGER. SNAPPING TURTLES.

C. serpentina (Linnaeus) Schweigger. COMMON SNAPPING TURTLE.

Common in all sluggish streams and ponds.

FAMILY TRIONYCHIDÆ. (THE SOFT-SHELLED TURTLES.)

ASPIDONECTES WAGLER. SOFT-SHELLED TURTLES.

A. spinifer (LeSueur) Agassiz. COMMON SOFT-SHELLED TURTLE.

Very common.

ORDER LACERTILIA. (THE LIZARDS.)

FAMILY IGUANIDÆ. (THE IGUANAS.)

SCLOPORUS WIEGMANN. TREE SWIFTS.

S. undulatus (Harlan). PINE-TREE LIZARD. BROWN SWIFT.

Abundant. It may be seen any warm day in summer, sunning itself on the fences. I have seen it frequently in town. Harmless.

FAMILY TEIDÆ. (THE TEGUENINS.)

CNEMIDOPHORUS WIEGMANN. TARAGUIRAS.

C. sexlineatus (Linnaeus). SIX-LINED LIZARD.

I have only seen one specimen of this lizard from the county.

FAMILY SCINCIDÆ. (THE SKINKS.)

EUMECES WIEGMANN. BLUE TAILS.

E. fasciatus (Linnaeus). BLUE-TAILED LIZARD; BLUE-TAILED SKINK.

Not common, but several specimens have been taken in the county.

ORDER OPHIDIA. (THE SERPENTS.)

FAMILY COLUBRIDÆ. (THE COLUBRINE SNAKES.)

HETERODON BEAUVAIS. SPREADING ADDERS.

H. platyrhinus Latreille. BLOWING VIPER; HOG-NOSE SNAKE.

Rather common, but not so common as the next named species.

H. sinus (Linnaeus) Holbrook. SAND VIPER.

Differs very little from the above, except in the arrangement of dorsal branches. Very common. Harmless.

TROPIDONOTUS KILL. WATER SNAKES.

T. sipedon (*Linnaeus*) *Holbrook*. WATER SNAKE; WATER ADDER.
Very common along all our streams.

T. leberis (*Linnaeus*) *Holbrook*. LEATHER SNAKE.
Also very common.

ENTLENA BAIRD & GIRARD. GARTER SNAKES.

E. sirtalis (*Linnaeus*) *Baird & Girard*. COMMON GARTER SNAKE.
Common everywhere. Harmless.

BASCANIUM BAIRD & GIRARD. BLACK SNAKES.

B. constrictor (*Linnaeus*) *Baird & Girard*. BLACK SNAKE.

Common. It is frequently found about the barns and outhouses on the farm, and does great service in destroying rats and other objectionable animals.

COLUBER LINNEUS. RACERS.

C. guttatus (*Linnaeus*) SPOTTED RACER.

Only one specimen of this snake has been taken in the county. That one was taken by E. R. Quick, just south of town, in September of 1895. It is very beautifully colored, and, like the balance of the racers, is perfectly harmless.

C. obsoletus *Say*. PILOT SNAKE; BLUE RACER.

Common. Most frequently found in meadows. It is very swift in its movements, and, like the black snake, should be protected.

C. emoryi (*Baird & Girard*) *Cope*. EMORY'S RACER.

Only one specimen of this snake has been taken in the county. It was taken by myself about two years ago on a hill west of Brookville, and is now in the collection of the Society of Natural History.

DIADOPHIS BAIRD & GIRARD. RING-NECKED SNAKES.

D. punctatus (*Linnaeus*) *Baird & Girard*. RING-NECKED SNAKE.

One specimen only has been taken in the county. That one was taken by Mr. Frank Fogle about two years ago. It is a very pretty little snake, and resembles the young of *Bascanium constrictor* in size and color.

OPHIOLUS BAIRD & GIRARD. KING SNAKES.

O. doliiatus var. triangulus (*Boie*) *Cope*. MUD SNAKE; HOUSE SNAKE; SPOTTED ADDER.

Common.

FAMILY CROTALIDÆ. (THE CROTALID SNAKES.)

CROTALUS LINNÆUS. RATTLESNAKES.

C. horridus Linnæus. BANDED, OR NORTHERN RATTLESNAKE.

Probably extinct in the county now, but quite common in the early settlement of the county.

ANCISTRODON BEAUVAIS. COPPERHEADS.

A. contortrix (Linnæus) Baird & Girard. COPPERHEAD.

This species is also probably extinct. It is reported frequently, but on examination the specimens prove to be *Heterodons*.

BATRACHIA. (THE BATRACHIANS.)

ORDER ANURA. (THE TAILLESS BATRACHIANS.)

FAMILY RANIDÆ. (THE FROGS.)

RANA LINNÆUS. FROGS.

R. virescens Kalm. LEOPARD FROG; COMMON FROG.

Very common in all localities.

R. palustris LeConte. PICKEREL FROG.

Not common.

R. clamitans Merrem. GREEN FROG; SPRING FROG.

Not common, but several specimens have been taken in the county.

R. catesbiana Shaw. BULL FROG.

Common in one or two localities only.

R. sylvatica LeConte. WOOD FROG.

Common in the upland woods; not aquatic.

FAMILY HYLIDÆ. (THE TREE FROGS.)

HYLA LAURENTI. TREE FROGS.

H. versicolor LeConte. COMMON TREE TOAD.

Abundant.

ACRIS DUMERIL & BIBRON. CRICKET FROGS.

A. gryllus var. *crepitans* (Baird) Cope. CRICKET FROG.

Rather common.

FAMILY BUFONIDÆ. (THE TOADS.)

BUFO LAURENTI. TOADS.

B. lentiginosus Shaw. AMERICAN TOAD; COMMON TOAD.

Abundant.

ORDER URODELA. (THE SALAMANDERS.)

FAMILY SALAMANDRIDÆ. (THE NEWTS.)

DIEMYCTYLUS RAFINESQUE. SPOTTED NEWTS.

D. viredescens Rafinesque. SPOTTED TRITON; NEWT.

Very common.

FAMILY DESMOGNATHIDÆ. (THE DESMOGNATHS.)

DESMOGNATHUS BAIRD. DUSKY SALAMANDER.

D. fusca (Rafinesque) Baird. DUSKY SALAMANDER.

Most common species in the county.

FAMILY PLETHODONTIDÆ. (THE AMERICAN SALAMANDERS.)

HEMIDACTYLIUM TSCHUDI. FOUR-TOED SALAMANDERS.

H. scutatum (Schlegel) Tschudi. FOUR-TOED SALAMANDER.

I have never taken this Salamander in the county myself, but Mr. E. R. Quick informs me that in one or two localities they are not uncommon.

PLETHODON TSCHUDI. PLETHODONTS.

P. erythronotus (Green) Baird. RED-BACKED SALAMANDER.

Common.

SPELERPES RAFINESQUE. CAVE SALAMANDER.

S. bilineatus (Green) Baird. TWO-STRIPED SALAMANDER.

Several specimens of this Salamander have been taken in the county.

S. longicaudus (Green) Baird. CAVE SALAMANDER.

Mr. E. R. Quick is the only one I know who has taken the Cave Salamander in the county. He informs me that in one locality, about two and a half miles from town, they are common, but that he has never taken them from any other locality.

FAMILY AMBLYSTOMIDÆ. (THE AMBLYSTOMAS.)

AMBLYSTOMA TSCHUDI. BIG SALAMANDERS.

A. punctatum (Linnaeus) Baird. LARGE SPOTTED SALAMANDER.

Not common; one specimen furnished me by E. R. Quick.

FAMILY MENOPOMIDÆ. (THE MENOPOMES.)

CRYPTOBRANCHUS LEUCKART. HELLBENDERS.

C. alleghaniensis Harlan. HELLBENDER; BIG WATER LIZARD.

I have never seen the Hellbender in the county myself, but put it in this list on the authority of Mr. E. R. Quick.

ORDER PROTEIDA. (THE PROTEANS.)

FAMILY PROTEIDÆ. (THE MUD PUPPIES.)

NECTURUS RAFINESQUE. MUD PUPPIES.

N. maculatus Rafinesque. MENOBRANCHUS; MUD PUPPY; WATER DOG.
Not unfrequently taken in the streams of the county.

THE FLORA OF FRANKLIN COUNTY, ENDOGENS.

BY O. M. MEYNCKE.

ARACEÆ. ARUM FAMILY.

ARISÆMA. MARTIUS.

A. tryphillum Torr. INDIAN TURNIP. Common.

A. dracontium Schott. GREEN DRAGONS.

SYMPLOCARPUS. SALISB.

S. foetidus Salisb. SKUNK CABBAGE. Rare.

ACORUS L.

A. Calamus L. SWEET FLAG; CALAMUS. Common.

TYPHACEÆ. CAT-TAIL FAMILY.

TYPHA. TOURN.

T. latifolia L. Common Cat-tail or Reed-mace.

ALISMACEÆ. WATER PLAIN-TAIN FAMILY.

ALISMA. L.

A. Plantago L. VAR. AMERICANUM Gray. WATER PLAIN-TAIN. Not common.

SAGITTARIA. L.

S. variabilis Engelm. ARROW-HEAD. Common.

ORCHIDACEÆ. ORCHIS FAMILY.

ORCHIS. L.

O. spectabilis L. SHOWY ORCHIS. Frequent.

SPIRANTHES. RICHARD.

S. gracilis Bigelow. LADY'S TRESSES. Not common.

LIPARIS. RICHARD.

L. liliifolia Richard. TWAYBLADE. Not common.

CORALLORHIZA. HALLER.

C. odontorhiza Nutt. CORAL-ROOT. RARE.

APLECTRUM. NUTT.

A. hyemale Nutt. PUTTY-ROOT; ADAM-AND-EVE. COMMON.

CYPRIPEDIUM. L.

C. pubescens Willd. LARGE YELLOW LADY'S SLIPPER. Becoming rare.

AMARYLLIDACEÆ. AMARYLLIS FAMILY.

HYPOXIS. L.

H. erecta L. STAR-GRASS. Not rare.

IRIDACEÆ. IRIS FAMILY.

IRIS. L.

I. versicolor L. LARGE BLUE FLAG.

PARDANTHIUS. KER.

P. chirsensis Ker. BLACKBERRY LILY. Escaped cultivation.

SISYRINCHIUM. L.

S. Bermudiana L. BLUE-EYED GRASS. Frequent.

DIOSCOREACEÆ. YAM FAMILY.

DIOSCOREA. PLUMER.

D. villosa L. WILD YAM-ROOT. Not rare.

SMILACÆE. SMILAX FAMILY.

SMILAX. TOURN.

S. rotundifolia L. COMMON GREENBRIER.*S. herbacea* L. CARRION FLOWER. Frequent.

LILIACEÆ. LILY FAMILY.

TRILLIUM. L.

T. sessile L. Common.*T. recurvatum* Beck. Common.*T. erectum* L. var. *declinatum* Gray.*T. cernuum* L. NODDING TRILLIUM, OR WAKE ROBIN. Frequent.

MELANTHIUM. GRONOR L.

M. virginicum L. BUNCH FLOWER. Frequent.

UVULARIA. L.

U. grandiflora Smith. Frequent.*U. perfoliata* L.

SMILACINA. DESF.

S. racemosa Desf. FALSE SPIKENARD. Common.*S. stellata* Desf.* Not rare.

POLYGONATUM. TOURN.

- P. biflorum* *Eu.* SMALLER SOLOMON'S SEAL.
P. giganteum *Deltrich.* GREAT SOLOMON'S SEAL. Common.

ASPARAGUS. L.

- A. officinalis* L. ASPARAGUS. Escaped cultivation.

LILIUM. L.

- L. canadense* L. WILD YELLOW LILY. Rare.
L. supertum L. TURKS-CAP LILY. Frequent.

ERYTHRONIUM. L.

- E. Americanum* *Smith.* YELLOW ADDERS-TONGUE. Common.
E. albidum *Nutt.* Frequent.

SCILLA. L.

- S. Fraseri* *Gray.* EASTERN GUAMASH; WILD HYACINTH. Frequent.

ALLIUM. L.

- A. cernuum* *Roth.* WILD ONION. Frequent.
A. vineale L. FIELD GARLIC.
A. canadense *Kalm.* WILD GARLIC.

JUNCACEÆ. RUSH FAMILY.

LUZULA. DC.

- L. campestris* DC. WOOD RUSH. Common.

JUNCUS. L.

- J. effusus* L. COMMON OR SOFT RUSH.
J. marginotus *Rostkovius.* Frequent.
J. tenuis *Willd.*

COMMELYNACEÆ. SPIDERWORT FAMILY.

TRADESCANTIA. L.

- T. virginica* L. COMMON SPIDERWORT.
T. pilosa *Lehm.*

CYPERACEÆ. SEDGE FAMILY.

CYPERUS. L. GALINGALE.

- C. diandrus* *Torr.* Common.
C. plymatodes *Muhl.*
C. strigosus L. Common.

ELEOCHARIS. R. Br.

- E. obtusa* *Schultes.* Very common.
E. palustris R. Br. Very common.
E. intermedia *Shultes.*
E. acicularis R. Br.

SCIRPUS. L. BUL-RUSH OR CLUB-RUSH.

- S. pungens* Vahl. Common.
S. polyphyllus Vahl. Frequent.
S. lineatus Michx. Common.

CAREX. L.

- C. Studellii* Kunth. Common.
C. rosea Schk.
C. lagopodioides Schk. Frequent.
C. cristata Schreb. var. *mirabilis* Boott.
C. straminea Schk. var. *festucacea* Gray. Common.
C. laxiflora Lam. var. *plantiginea* Boott. var. *blanda* Gray. var. *latifolia* Boott. Common.
C. oligocarpa Schk.
C. Pennsylvanica Lam.
C. varia Muhl.

GRAMINÆ. GRASS FAMILY.

LEERSIA. SOLANDER.

- L. Virginica* Willd. WHITE GRASS. Frequent.
L. oryzoides Swartz. RICE CUT-GRASS.

PIEULUM. L.

- P. pratense* L. TIMOTHY GRASS. Escaped cultivation.

AGROSTIS. L.

- A. vulgaris* With. RED-TOP. Very common.
A. alba L. WHITE BENT-GRASS.

CINNA. L.

- C. arundinacea* L. WOOD REED GRASS. Frequent.

MUHLENBERGIA. SCHREBER.

- M. Mexicana* Trin. DROP-SLED GRASS. Common.

ELEUSINE. GAERTN.

- E. Indica* Gaertn. CRAB GRASS; YARD GRASS. Common.

DACTYLIS. L.

- D. Glomerata* L. ORCHARD GRASS. Escaped.

GLYCESIA. R. BR.

- G. nervata* Trin. FOWL MEADOW GRASS. Frequent.

POA. L.

- P. annua* L. LOW SPEER GRASS. Frequent.
P. compressa L. WIRE GRASS. Common.
P. pratensis L. KENTUCKY BLUE GRASS. Abundant.

ERAGROSTIS. BEAUV.

- E. upaus* Beauv. Frequent.
E. poaeoides Beauv. var. *megastachya* Gray.
E. pectinacea Gray. var. *spectabilis* Gray. Common.

BROMUS. L.

- B. secalinus* L. CHEAT OR CHESS. Common.
B. ciliatus L. var. *purgans* Gray. HAIRY CHESS.

ELYMUS. L.

- E. Virginicus* L. WILD RYE. Common.
E. canadensis L. WILD RYE. Frequent.

GYMNOSTICHUM. SCHREB.

- G. Hystrix* Schreb. BOTTLE-BRUSH GRASS.

PANICUM. L.

- P. sanguinale* L. COMMON CRAB OR FINGER GRASS.
P. proliferum Lam. Frequent.
P. capillare L. OLD-WITCH GRASS. Very common.
P. latifolium L. Common. s
P. dichotomum L.
P. crus-galli L. BARN-YARD GRASS.

SETARIA. BEAUV.

- S. glauca* Beauv. FOXTAIL. Common.
S. viridis Beauv. GREEN FOXTAIL.

CENCHUS. L.

- C. tribuloides* L. HEDGEHOG OR BUR-GRASS. Common.

FOSSIL CORALS OF FRANKLIN COUNTY, INDIANA.

BY DAVID R. MOORE.

The distribution of Fossil Corals in Franklin County is confined to the Lower and Upper Silurian ages, and Devonian drift.

For variety in genera and species the large area of the Lower Silurian presents an interesting field.

A few Upper Silurian representatives are found in the localities of outcrops of that age.

Representatives from the Devonian drift form no inconsiderable part of the Palæontology of the County.

The following list is far from exhaustive; but indicative of the extent and variety of ancient Coral life within the bounds of the County; also of progress so far made in the discovery and determination of genera and species.

As Curator of Geology, and especially in the work of preparing this list, I am indebted to other members of the Society for valuable aid.

The authorities exclusively depended upon for descriptions and nomenclature are the Palæontology of Ohio, Vol. II; and the Indiana Geological Reports of 1881-82.

LOWER SILURIAN.

GENUS CHÆTETES.

Chætetes dælii, Edwards and Haine. Common.

- *approximatus*, Nich.
- *pulchellus*, Edwards and Haine.
- *subpulchellus*, Nich.
- *discoideus*, James.
- *newberryi*, Nich.
- *frondosus*, D'Orb.
- *ortoni*, Nich.
- *corticans*, Nich. Parasitic.

GENUS FAVISTELLA.

Favistella stellata, Hall.

GENUS CONSTELLARIA.

Constellaria antheloidea, Hall. Rare.

GENUS STREPTELASMA.

Streptelasma corniculum, Hall. Plentiful.

— *radicans*, Hall.

GENUS PALÆOPHYLLUM.

Palæophyllum divaricans, Nich.

GENUS COLUMNOPORA.

Columnopora cribiformis Nich. Plentiful.

GENUS HIPPOTHOA.

Hippothoa inflata, Hall.

UPPER SILURIAN.

GENUS LICHENALIA.

Lichenalia concentrica, Hall.

varieties } *parvula*.
 } *maculata*.

GENUS HALYSITES.

Halysites catenulata, Linn.

GENUS FAVOSITES.

Favosites spinigerus, Hall.

— *forbesi* var. *occidentalis*, Hall.

— *favosus*, Goldfuss.

GENUS ERIDOPHYLLUM.

Eridophyllum rugosum, Edw. and Haine.

DEVONIAN DRIFT.

GENUS AULOPORA.

Aulopora arachnoidea, Hall. Parasitic.

GENUS FAVOSITES.

Favosites basaltica, Goldfuss.

— *hemisphericus*, Hall.

GENUS ZAPHRENTIS.

Zaphrentis prolifica, Billings.

ERRATA.

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- Line 21, page 8, for "in" read "into."
Line 11, page 9, for "Kirland" read "Kirtland."
Line 29, page 12, for "traverse" read "traverses."
Line 5, page 16, for "Baldparte" read "Baldpate."
Line 7, page 20, for "Galinago" read "Gallinago."
Line 7, page 21, for "Charadius" read "Charadrius."
Line 7, page 28, for "Epidonax" read "Empidonax."

BULLETIN

—OF THE—

BROOKVILLE SOCIETY

—OF—

Natural History.

NO. 3.

CONTENTS.

<i>List, with brief Description of all the Species, Including one new to Science, of Myriapoda of Franklin Co., Ind., by Jerome McNeill, ..</i>	1
<i>Dr. Rufus Haymond, by E. R. Quick,</i>	21
<i>Alluvial Terraces, by E. R. Quick,</i>	26

—PUBLISHED BY THE SOCIETY.—

T. W. McCLOSSE, | *Editor.*
E. R. QUICK.

BULLETIN
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BROOKVILLE SOCIETY

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NO. 3.

CONTRIBUTIONS
—TO THE—
NATURAL HISTORY

—OF—
FRANKLIN COUNTY, INDIANA.

COLLEGE CORNER, OHIO,
INVESTIGATOR PRINTING HOUSE

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A LIST, WITH BRIEF DESCRIPTIONS OF ALL THE SPECIES, INCLUDING
ONE NEW TO SCIENCE, OF MYRIAPODA OF FRANKLIN CO., IND.

BY JEROME MCNEILL, MOLINE, ILL.

The present paper is based mainly on a small collection made by the writer, with the help of several friends, during the summer meeting of the Indiana Academy of Science at Brookville, in May 1888, and a second collection made subsequent to the first by Mr. A. W. Butler and Mr. Edward Hughes, of Brookville. In addition to the forms contained in the above mentioned collections, a very considerable number have been included in this paper, whose occurrence in Franklin County, although not yet known is rendered almost certain from the presence in collections made in the Counties of Monroe, Brown, Bartholomew, Decatur, Union, Wayne, Henry and Fayette. Even with this help it is not possible to make the list complete, since insects of this order have been so little studied and collected that a considerable number, doubtless, remain to be described or recorded. With a view to the encouragement of this local observation, which is so much needed in almost every department of Natural Science, I have included with this list brief descriptions of all the species enumerated together with key to species, genera and higher groups.

No special apparatus is needed for collecting Myriapods. A delicate pair of forceps will occasionally prove useful in drawing specimens from their hiding places in the crevices of bark or of rotten wood. They may be put immediately into alcohol, or as I prefer, killed in cyanide bottle. If the latter method is employed the specimens can be easily separated from the dirt that is sure to be collected with them, and much cleaner specimens will be preserved. In either case the alcohol, which may be diluted from 25 to 50 per cent., should be changed at least once, usually after two weeks or more. All of the Chilognatha (Myriapods with a horny shell and two pairs of feet to a segment) will have their value as material for future study, infinitely increased if, after they have soaked in alcohol for a few days, they are taken out and straightened and allowed to dry in that position before they are returned to their bottles. For studying them a good lens magnifying from five to ten diameters will usually be all that is needed; but a higher power will sometimes be found necessary in determining the number of eyes in *Lithobius*, and other minute characters. They may be looked for in rotten wood and stumps, under logs, rails, leaves in

moist situations, or fragments of wood and bark, and under the bark of partially decayed logs. Several species will be found most abundant about door yards and gardens. As a rule they prefer high, dry and rich soils to those that are low, moist or wet, or poor. No more useful work can be done in this order than the study of the food, habits, and immature stages of the different species as these data are extremely meager.

MYRIAPODA.

Are wingless terrestrial insects, with the body distinct, divided into two regions, head and abdomen, the latter plainly segmented, each segment, being provided with either one or two pairs of feet. Some of them at least undergo metamorphosis and, unlike either Hexapodous or Arachnoid insects, they grow by the addition of segments to the body. The segments which are added after birth are developed immediately anterior to the ultimate segment. The organs of special sense are well or moderately well developed. A single pair of antennae are always present but in the lowest suborder these are three forked. The number of joints in the antennae vary from 5 to an indefinite number. As a rule the more joints the higher the organization, while the reverse is true of the segments which vary in number from 6 to 173 or more. The eyes are of little importance to them on account of the subterranean habits of the species. They are present or wanting in very nearly related and almost equally developed genera, and sometimes present in one genus and wanting in another which is in many respects higher. The mouth-parts are usually well developed and are fitted for seizing and holding prey, for gnawing or for sucking. Insects belonging to this order are almost all either beneficial or innoxious. They are usually grouped in three suborders, as follows:

1. (3.) Antennae 5 jointed, bifid, with three long jointed appendages.
2. Body composed of 6-10 segments; nine pairs of legs; species minute 0.5 to 1.5 mil. long. - - - - - PAUROPODA.
3. (1.) Antennae more than 5 jointed; simple.
4. (5.) Body more or less cylindric or half cylindric; head normally composed of three segments; antennae 7-8 jointed; mouth-parts consisting of protomale (mandibles) and dentomale (1st maxillae); anal opening a longitudinal slit; legs two pairs to most of the segments. - - - - - CHILOGNATHA.
5. (4.) Body usually flattened; head composed of five modified segments; antennae 12 or more jointed; mouth-parts protomale, dentomale, first and second malapodes; one pair of legs to each segment. - - - - - CHILOPODA.

The First Suborder PAUROPODA.

Contains but two families and three species which have as yet only been reported from three or four localities on the Atlantic coast. Some of these species may be looked for here. They are likely to be under leaves or light chips or the scaly bark of apple trees.

The Second Suborder CHILOGNATHA.

(Or DIPLOPODA.) In addition to the characters already mentioned

is distinguished from the Chilopoda by having the genitalia always in the front part of the body, while in the latter these organs are all attached to the anal segment. As the head of Chilognaths is composed of but three segments, they possess no organs homologous to the first and second malapodes (foot-jaws; the second pair being the so-called poison fangs) of Chilopods. The organ, of special sense are much less perfectly developed in Chilognatha than in Chilopoda. The eyes, frequently absent, are usually, triangular in shape and but little elevated above the surrounding surface. According to Cope the eyes in Petasoptes consist of a linear mass of black pigment not divided into ocelli. The antennae are usually short and clumsy. The young are born with six legs and from seven to fourteen body segments. They probably all undergo metamorphosis. Their food consists of decaying vegetable and animal matter. Their haunts are principally about decaying logs and rails in the open borders of woods and in clearings. They are entirely destitute of offensive weapons; their sole defense being in their hard shells. Almost all the species belonging to this group, when disturbed roll themselves into a coil with the head on the inside.

The Third Suborder CHILOPODA.

Is in many respects the highest. The typical forms are essentially predaceous. Their powerful foot-jaws, generally provided with poison glands, enable them to seize their prey and guide it to the mouth. Their long and powerful legs make it possible for them to overtake any insect that is obliged to depend upon its running powers for escape. Their soft, flat bodies covered with a membranous or leathery integument are admirably fitted for squeezing and wriggling through tight places. Their eyes, when present, are so placed that they can see behind as well as ahead, and their antennae are long tapering and very flexible, so that, within their range, they are a terrible scourge to other insects. They make the struggle for existence as hard in the cracks and crannies and dark corners of the world as it is in the crowded sunshine.

CHILOGNATHA.

Is represented in the United States by six families.

6 (7.) Body small [2.5 mil. long] soft skinned, covered with penicillate scales and fascicles of hairs; anus in the penultimate segment; 13 pairs of legs.

FAM. 1. POLYXENIDÆ.

This family includes but a single genus and species *P. fasciculatus* Say, said by Wood to inhabit the Southern States. Underwood states that it is "distributed from Massachusetts to Georgia." It has never been reported from the Central States but its occurrence here is not improbable.

7. (6.) Body covering crustaceous; legs not less than 17 pairs.
 8. (17.) Head small, conical; protomale minute; dentomale obsolete; mouth
 suctorial.

FAM. 2 POLYZONIDÆ.

This family is divided into five genera, as follows:

9. (10.) Sixth and Seventh joints of the antennæ confluent with the fifth and with
 it forming a club.

ANDROGNATHUS COPE.

This genus contains a single species reported by Cope from Montgomery Co., Va. He makes it the type of a new family *Andrognathidae*.

10. (9.) Joints of antennæ not forming a club.
 11. (12.) Eyes wanting; rostrum shorter than antennæ.

PLATYDESMUS LUCAS.

P. LeContei Wood, from Georgia.

P. rosea Murray, from California.

12. (11.) Eyes present, conspicuous.
 13. [14.][16.] Eyes 8; body segments about 45.

OCTOGLENA WOOD.

Contains a single species *O. bivirgata*, Wood, found in the mountains of Ga.

14. [15.][16.] Eyes 6, in two diverging rows; head concealed by first segment.

HEXOGLENA McNEILL.

15. Segments about 46; light brown or parchment colored above, dirty white below;
 dorsum convex, venter moderately concave. Legs when extended not
 reaching beyond the body. First scutum one-twenty first, last scutum
 one-tenth the width of the body. Length 18 mil., width 3 mil.

Hexoglena cryptocephalus McNeill.

This species is common about Bloomington, Ind., and its occurrence in Franklin County is almost certain. It will be found in small colonies in thoroughly decayed stumps.

16. [14.][13.] Eyes 2; body segments 50-53.

PETASERPES COPE.

Contains a single species from the Cumberland mountains in East Tennessee.

17. (8.) Mouth-parts masticatory; protomale and dentomale well developed.
 18. (37.) Body composed of 35 segments or fewer.
 19. (28.) Body composed of 19-20 segments, scuta generally projecting laterally into
 laminae; legs 28-31 pairs; eyes wanting.

FAM. 3 POLYDESMIDÆ.

This family contains about twenty-five species all of which are still included in a single genus, *Polydesmus*. Though doubtless the genus will admit of being divided to advantage, this work would better be left until so large a proportion of the species are discovered and studied that the work may be done once for all. The absence of eyes, the small development of the antennæ, and the general habits of these species place them very near the lower end of the scale, in development, they scarcely rank above *Polyzonidæ*. Their food being, in every case but one, so far as I know, rotten wood. Dr. C. H. Wood says that *P. impurus* Wood, from Texas is to be found generally under old cow dung. The genitalia of female *Polydesmidæ* are situated in

the third body segment just posterior to the third pair of legs. They are never conspicuous and often minute. The male genitalia on the contrary are usually large and quite easily seen. They are situated in the seventh segment occupying the place of the eighth pair of legs. These furnish by far the best specific characters for this family. The color and sculpturing of the scuta together with the size, position and color of the lateral laminae are useful in classification. The character of the anal scutum is perhaps the most constant structural feature within a species and is very useful in determining immature forms.

20. [23.] Scuta sculptured; lateral laminae horizontal.

21. [22.] Scuta covered with convex tuberculoid setatipped scales.

Polydesmus setiger Wood.

The lateral laminae have their margins strongly and acutely serrate especially towards the head. The last scutum is triangular with the apex prolonged and decurved.

This species is very common and very widely distributed. Its habitat is probably the United States east of the Rocky Mountains. There are no specimens in the collection from Brookville, but it will certainly be found there. This is one of the species which is sometimes abundant in yards and old gardens. My friend, Mr. C. H. Rollman, of Bloomington, Ind., collected from under old boards placed about the premises and examined two or three times a day for three weeks, more than two thousand individuals of this species.

22. [21.] Scuta with eight scales arranged in two series; color brown.

P. canadensis Newport.

These scales or scale-like tubercles occupy the posterior half of the scuta, the anterior half is usually smooth and rather convex with a median furrow dividing it into two halves. In most specimens will also be found on either side of the double row of scales a large swelling situated partially upon the lateral laminae. Last scutum triangular. Apex obtuse, decurved. Length 25 to 30 mil.

Its habitat is the same as that of *P. setiger*. It occurs in much the same situations as *P. erythropygus* and is scarcely less abundant.

23. [20.] Scuta smooth, particolored; dorsum convex.

24. [25.] Lateral laminae large, horizontal; color olive chestnut, with the lateral laminae and a large semicircular spot on the posterior margins of the scuta reddish orange.

P. erythropygus Brandt.

The anal scutum is broad and almost uncinate being nearly straight, broad at the tip and slightly rounded. Length 30-40 mil. This is the commonest *Chilopmuth* in the Mississippi valley. I have never seen it reported from east of the Alleghanies or west of the Rocky Mountains. I have reason to think it is replaced in Florida and the extreme South by closely allied forms. This form will probably be found less frequently in cultivated ground than the two preceeding species.

25. [24.] Lateral laminae large, depressed.

26. [27.] Color blackish chestnut with yellowish lateral laminae, legs and venter; and a yellowish line on the posterior margins of the scuta.

Polydesmus corrugatus Wood.

The coxæ as well as the femora are armed at the apex with the robust but acute spines. The sterna are smooth with no indication of lateral tubercles. The anal scutum is triangular, elongate and truncate. Length 40 to 50 mil; width 8 to 10 mil.

This is one of our handsomest species. It is common at Brookville and at Dublin, Ind., but rather rare at Bloomington, Ind. Its habitat is much the same as that of *P. erythropygus*, but is not nearly so common a species, its distribution being restricted to particular localities instead of being general.

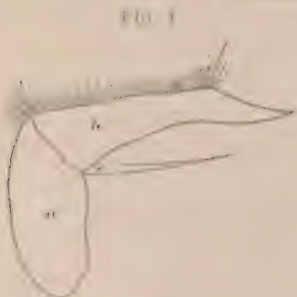
27. [26.] Color dilute chestnut, with pinkish lateral laminae and a narrow band of the same color on the posterior margins of the scuta.

Polydesmus butlerii. N. Sp.

This species bears a general resemblance to *Polydesmus corrugatus* Wood with which I at first placed it, as I had no males and was unwilling to risk a synonym until I had compared the male genitalia. As I received two male specimens in the second collection from Franklin Co., I am now able to figure the genitalia, which will be seen to be strikingly unlike the genitalia of *P. corrugatus* or any other species that I know of, figured or described.

Dorsum strongly convex; lateral luminae large, depressed and extended into blunt processes posteriorly. The color is dilute chestnut with the venter and legs, lateral laminae and a narrow band on the caudal margins of the scuta dull pink, fading in alcohol. The first scutum is banded anteriorly as well as posteriorly. All of the bands tend to widen near the medium line of the dorsum. The head is colored similarly to the body and the medium sulcus is distinct. The anal scutum is large, triangular, with the apex truncate. The sterna have their caudal margins produced at the sides into blunt tubercles. The coxæ of all the legs are unarmed, the femora are armed at the distal end with a short but generally acute spinous process.

MAGNIFIED 16 DIAMETERS.



Lateral view of base and spinous processes of one-half of male genitalia.



Medial view of a portion of the base and the spinous processes of the male genitalia.



Ventral view of spinous processes
of male genitalia.

The genitalia of the male are composed of two smooth perpendicular subcylindrical basal pieces (Fig. 1. a.) from which extends forward the principal spinous process, (Fig. 1. b.) being at right angles to the base and parallel to the body. This process is quite robust, densely pilose at the proximal end on the inner side, less pilose on the upper side and along the inner margin to base of the smaller, (Fig. 2. d.) of the two processes into which the distal end of the main process is divided. The smaller of these is smooth, robust at the base but slenderly acuminate at the apex; the larger is smooth, broad and thin, and slightly twisted. From the base of the main process arises another process, which is remarkably long, smooth and attenuated. It is concealed in the ventral view but is seen in the lateral and medium views (Fig. 1. & 3. c.). It extends as far forwards as the apex of the smaller distal process. From the distal end of the basal piece on its inner side arises a secondary spinous process (Fig. 2. & 3. f.) which is short, smooth, compressed and curved rapidly forward against the proximal end of the principal process. The length of the basal piece is one and one-fifth mil., of the main process two mil., of the slender process arising from the base of the main process one and one-sixth mil. The length of the body is thirty min. (one and one-fifth inches), the width is 7 mil. (seven-twenty fifths of an inch.)

Habitat Franklin Co., Ind.

The description is based on 6 individuals, 4 males and 2 females. I have named this species in honor of Mr. Amos W. Butler.

28. [19.] Body with about 30 segments; scuta generally setose; eyes generally present and distinct.

FAM. 4. CHORDEUMIDÆ

This family as at present constituted contains five genera. This number however will probably be diminished by a careful revision. The species are for the most part cave inhabiting.

29. [30.] Body not setose; antennæ long; eighth pair of legs of male modified, six jointed; genitalia small.

PSEVDOTREMIA COPE.

The single species *P. cavernarum* Cope has been reported from Wyandotte and Bradford caves, Indiana, Carter and Zwingler caves, Kentucky, and numerous small caves in Pennsylvania and Virginia.

30. [29.] Body setose.

31. [34.] Eyes present.

32. [33.] Body short and thick; eyes triangular; antennae slender; setae one-fifth as long as the body is thick; legs long and slender, eighth pair modified in the male.

CRYPTOTRICHUS PACKARD.

C. caesiannulatus Wood, is the solitary species. The body is horn-brown in color varied with darker color. A medium pale dorsal groove runs the whole length of the body. The hind margin of each scutum is bordered by a silver-gray band. The scuta are furnished with 6-8 white, depressed, setiferous spots arranged in transverse lines. Length 15-20 mil. Habitat, the southern portion of the Mississippi valley. Not uncommon at Bloomington and at Dublin, Ind. It is found in much the same situations as *P. setiger* and has been reported as occurring in caves.

33. [32.] Body short and fusiform; eighth pair of legs of male two-jointed; setae at least half as long as the body is thick.

TRICHOPETALUM HARGER.

Dirty white, banded transversely and mottled with light brown anteriorly. Segments 28; male with 45, female 46 legs. Eyes of 10 ocelli in a lunate group.

T. lunatum Harger.

The species like *C. caesiannulatus* has an impressed dorsal line. The scuta also bear three setiferous tubercles on each side, the two lower being approximate. The two inner bristles on the anal scutum have thickened bases. The legs are slender, white, hairy, with the proultimate joint lengthened. Length 6 mil. Habitat Connecticut to Indiana. It is not uncommon at Dublin and Bloomington under leaves and bark in moist places. I have found it frequently associated with *Scelopendrella*. Besides the species already mentioned there have been described under *Tricopetatum*.

T. gomeratum, Harger.

From John Day River Oregon.

T. fulvipes, Harger.

From the north shore of Lake Superior.

T. bollmani, McNeill.

From Mayfield's Cave, Monroe Co., Ind.

34. (32.) Eyes wanting; body slender.

35. (36.) Eighth pair of legs of male two-jointed ending in a claw; setae very long.

SCOTERPES COPE.

The single species *S. copei* seems to be limited to Mammoth cave and other small caves in its vicinity.

36. (35.) Site shorter than in *S. copei*; sixth pair of legs of male greatly swollen.

ZYGONOPUS RYDER.

The solitary species *Z. whitei* Ryder, has been reported from New Market, Luray and Weyer's caves, Virginia.

37. (18.) Body composed of more than 32 segments.

38. (41.) Body long slender, tapering; scuta usually deeply furrowed, antennae long and slender, the seventh segment short and conic; legs very long, the eighth pair only modified in the male, the seventh and ninth pairs normal; sterna free.

FAM. 5 LISIOPETALIDÆ.

This family as at present constituted consists of a single genus, LISIOPETATUM, BRANDT, and two closely allied species. The second only of the species described below has been reported from Indiana, but I give a description of the other that the specimens found in Franklin County and elsewhere in Indiana, may be compared with each description.

39. (10.) Body not setose; body segments 61 with 115 pair of legs. Body and head horn color, usually mottled and banded with dark blackish horn color. The body with a medium dull yellowish dorsal stripe and with a lateral row of concolorous diffuse spots, one on each longest lateral ridge. [The spots vary much, sometimes covering four or five ridges and extending low down on the sides of the scuta.] Each scutum, except those near the head and at the end of the body, has about twenty-five prominent ridges. The dorsal, twelve larger than those on the sides; these ridges are high with concave valleys between them. The ends of the ridges are acutely conical and project over the ends of the scuta. Length of the entire body 35 mil; thickness 2 mil. Habitat Mass. to Iowa and south to Florida and Louisiana. The above is Dr. Packard's description with some of the less important characters omitted.

L. lactarium Say.

40. (39.) Body setose; setae bristle like but easily visible to the naked eye; segments 58 with 102 pairs of legs. Body and head deep brown, almost black with a lighter brownish dorsal stripe, and a stripe of the same color along the sides. Each scutum except those near the extremities, has about 26 ridges situated upon the posterior two-thirds of each segment. These ridges are of two very unequal sizes, 14 small and 12 larger ones, alternating. The twelve larger ones are acutely conical and each projects over the following segment and ends in a short stiff bristle. Two of the small ridges are adjacent in the dorsal stripe. Immediately below the anal scutum on each side of the median line grow to very coarse setae from whose extremities two fine long setae proceed. Length 55 mil; width 3 mil. Habitat Indiana.

L. endasum McNeill.

This species is not uncommon at Bloomington, Brookville and Dublin, but it is very unequally distributed, at the first named point it is found in a very limited number of places, but in its favorite haunts is not shy. It is not unlikely that this is the species to which the specimen from New Grenada, in the Philadelphia Academy of Science should be referred. Dr. Packard remarks of the distribution of *L. lactarium*, "It probably ranges through Central into South America, as

Dr. Wood remarks: 'I have seen a single specimen, a female labeled as from New Grenada, which apparently belongs to this species'. This specimen I have seen in the Philadelphia Academy of Science, but did not compare it closely with our species. It is much larger than individuals from the United States.

41. (38.) Scuta moderately if at all furrowed; both pairs of legs of seventh segment modified in the male; sterna, at least of anterior segments, united so as to form complete rings.

FAM. 6 IULIDÆ.

This family contains the highest forms of Chilognatha with the exception perhaps of the Lisiopetalidæ. The antennæ and eyes are well developed except in the genus *Spirobolus*. This and the preceding family offer a marked exception to the rule that a large number of segments usually accompany and indicate a low organization. They are much better fitted for an active life than most other Chilognaths and it is very probable that their food is largely living instead of dead and decaying vegetable matter. These species are many of them nocturnal. I have seen *Iulus impressus* very late on summer evenings crawling over trees and fences, and in one case I found an individual clinging to the top of a long blade of grass, but it was too dark for me to learn what his particular business was there. It is not unlikely that some of them feed occasionally on the leaves as well as the roots of plants.

42. (41.) Scuta with distinct carinae; body long and slender, segments 50; antennæ short and thick; eyes in linear series.

CAMBALA GRAY.

This genus contains a single species *C. annulata* Say, confused often with *Lisiopetalum lactarium*, from which however it is easily distinguished by its linear eye-patches, and short thick antennæ.

43. Eyes consisting each of six ocelli in linear series; middle segments of the body with six sharp ridges above succeeded on the sides by about 12 smaller ridges on each side, gradually becoming obsolete on the venter; color of the body horn-brown, with the head, feet and antennæ pale flesh-color. Length 30 mil.

Cambala annulata Say.

Habitat Central and Southern States. This is a common species in Indiana, not yet reported from Brookville. It is said by Cope to be one of the most abundant species in the mountain regions of Tennessee and North Carolina. It has also been found in many Indiana, Kentucky and Virginia caves.

44. (42.) Scuta not carinate.

45. (47.) Scutum of the second segment extending beyond the first scutum at the sides so as to reach the head; antennæ short and thick, usually fitting into depressions on the anterior surface of the head.

SPIROBOLUS BRANDT.

46. Deep brown annulate with red; segments 50 to 57; scuta copiously minutely punctate; anal scale triangular.

Spirobolus marginatus Say.

Length 40 mil to 160 mil.

Habitat United States east of Rocky Mountains. This is a very variable species in size and coloring, and is indistinguishable from *S. unicolor* Wood except by the genital appendages. I am not sure that I have ever seen a specimen of *S. unicolor* from the eastern part of the United States, although I have formerly thought I could distinguish this species by the number of segments and other characters which I have since concluded are very inconstant. At present it is not possible to say how many species are included in the genus.

47. (45.) Scutum of the second segment not produced forward at the sides; antennae compared with those of *Spirobolus*, slender.

IULUS BRANDT.

The body in species belonging to this genus is always slender and usually less than three inches in length. The sexes are very readily distinguished by the form of the first scutum and the first pair of legs as well as by the genital appendages. This last mentioned character as in *Polydesmus* is often the best and not unfrequently the only means of distinguishing species. The secondary sexual characters just mentioned consist of the very conspicuous enlargement of the first pair of legs in the male and a modification in their form which probably serves a useful purpose in copulation. The antero-posterior diameter of the first scutum is also much greater in the male than the female, in the latter the anterior and posterior margins of this scutum meet at an acute angle, often more or less rounded at the apex; in the former, these margins meet the lateral margins nearly at right angles. This genus like *Spirobolus* is greatly in need of revision and it is difficult to say how many valid species it contains, but probably the number is not far from twenty-five. Except the genitalia, the most reliable specific characters are, in order of their importance, the number of segments, the color and markings of the scuta, and the character of the anal scutum, i. e., whether mucronate or not and if mucronate the size and position of the mucro.

48. (51.) Last scutum mucronate.

49. (50.) Mucro small; segments 50-53; scuta scarcely at all pilose.

IULUS IMPRESSUS Say.

The color is generally reddish chestnut, with a black dorsal line and lateral series of blackish spots, but in many specimens the color is almost uniformly deep chestnut with the dorsal line and lateral spots almost obsolete. Frequently the scuta are ornamented with whitish or light-red blotches on each side of the dorsal line. Length 35 to 50 mil.

Habitat United States east of the Rocky Mountains. This is a very abundant and wide spread species and in the Central States the handsomest as well as the commonest *Iulus*.

50. (49.) Mucro large and straight; segments 63, scuta on the upper surface distantly and obsoletely canaliculate; posterior segments decidedly pilose.

I. pennsylvanicus Brandt.

The general color of the species is dark chestnut brown, with a lateral series of black spots, more or less distinct, around which the color is lighter than the body color. Length 50 mil. to 60 mil.

Habitat Pennsylvania to Iowa and south to Florida. In Indiana and Illinois, a much less common species than the preceding.

51. (48.) Last scutum not mucronate.

52. (53.) Segments 42; body brownish with lateral series of strongly pronounced black spots; scuta canaliculate above and below.

I. hortensis Wood.

When examined with a magnifier the deep brown of the body is seen to be very beautifully varied with brighter color. In young individuals and adults that have recently moulted the color is very much lighter and the black spots more distinct. The black spots on the sides begin about the fifth or sixth segment and end about the thirty-ninth. Length 12 mil. to 15 mil.

Habitat Pennsylvania to Indiana. This species is rare at Bloomington. It is more likely to be found in cultivated than in uncultivated ground.

53. (52.) Segments 35; color deep brown with the dorsum yellowish, ornamented with a median black line; scuta closely canaliculate above and below.

I. virgatus Wood.

The coloring of this species makes it easily recognizable, in spite of its small size. Length 12 mil. to 18 mil.

Habitat Pennsylvania and Maryland to Indiana. It is not less rare in Indiana than the preceding species and is found in similar situations.

CHILOPODA.

54. (103.) Dorsal scuta 15 or more; tarsus three-jointed.

55. [83.] Feet-bearing segments 20 or more.

56. [72.] Feet-bearing segments 31 to 173; antennae 14 jointed.

FAM. 1 GEOPHILIDÆ.

This is a very homogenous family as, in addition to the characters given above, the species agree in the total absence of eyes and the character of the segments which are each composed of a complete leg-bearing segment and an incomplete footless segment closely coalesced with the first, but plainly indicated by the alternate smaller scuta. There are in the family upwards of thirty nominal species divided among five genera, most of the species live in the ground and are found rarely under old bark. The absence of good specific characters makes identification of the species a matter of considerable difficulty. The number of segments is probably the best guide, but this number varies within limits of from four to six, (as indicated by the feet.) The feet are invariably an odd number of pairs and generally the male have two pairs fewer than the lowest number the female of the same species have, and the female have two more pairs than the highest number the male have in the same species. The males are usually distinguished from the females by having the anal feet elongated and swollen.

57. [63.] Body narrowed anteriorly and posteriorly; head narrowed in front; claw of the second malapenes armed at the base with a strong tooth.

SCOLIOPLANES *n. n.*

58. [61.] Frontal lamina of the head separated from the cephalic lamina by an impressed line.
59. [60.] Feet of male pp 39-41, of female pp 37-41; decidedly attenuate before and behind; fulvous, with the head and antennae dilute brown; sparsely clothed with short hairs; feet sparsely covered with long hairs; spiracles round, in front small, in the middle and behind minute.

S. chionophilus Wood.

Præscuta in front, short or very short, in the middle and posteriorly long or very long. The coxæ of the anal feet are swollen and impressed with nine to thirteen large pits arranged in oblique, nearly straight, lines. The anal sternum is triangular. Length 22 to 25 mil.

Habitat Massachusetts to Indiana. Not common, under stones or other small bodies in hilly pasture land.

60. [59.] Feet of male pp 47-51, of female pp 49 to 53; much narrowed before and behind; fulvous, with the head dilute brown; body sparsely pilose with short hair, legs densely pilose; spiracles round, large, slightly smaller posteriorly.

S. bothriopus Wood.

The præscuta are long or very long. The coxæ of the anal feet are swollen and slightly pilose as well as impressed with 13 to 16 large and small pits arranged around one large pit removed from the others. The anal sterna is narrow with the sides rounded and converging posteriorly. Length female 24 mil., male 35 mil.

Habitat Massachusetts to Indiana. I have found *bothriopus* more common than *chionophilus*, but still not abundant by any means. It is found in much the same situations as the last.

61. [58.] Frontal lamina not distinct at all from the cephalic lamina.

62. Feet of the female pp 71 to 75, of the male pp 69 to 73; before much, behind plainly attenuate; yellow or fulvous at the extremities; smooth.

S. parviceps Wood.

The præscuta are rather short or short anteriorly, and somewhat longer posteriorly. The spiracles are large or very large in the front segments and gradually decrease in size until on the middle and posterior segments they are small. The anal coxæ are plainly swollen and smooth and impressed with about thirty large and small pores. Anal sternum narrow, with the sides nearly straight and rapidly converging behind. Length 47 mil. to 60 mil.

Habitat Pennsylvania to Indiana. *Parviceps* is much commoner than either of the preceding species. It is found in similar localities and also along the roadsides and in open woods under stones and logs.

63. [57.] Body scarcely or not at all narrowed in front, moderately narrowed behind; scuta bisulcate.

64. [60.] Cephalic lamina elongate, not narrowed in front more than behind; frontal lamina separated from the cephalic by an impressed line, basal lamina narrow, with the sides converging a little in front; præbasal lamina concealed. Coxal pores numerous, situated upon the dorsal as well as the ventral surface of the coxæ.

Mecistocephalus Newport.

There are almost no easily discernible, constant characters to distinguish this from the following genus. Wood gives the "cephalic seg-

ment twice as long as broad; antennae approximate; but I know of no *Mecistophabus* that has the cephalic segment more than once and a half as long as broad, and in the only illustration Wood gives of the head of this genus, the length is not more than I have stated. The whole head however is certainly longer and narrower than *Geophilus*.

None of this genus have yet been discovered in Franklin Co., and as I have found none of the five or six species comprising the genus at all common in Indiana. I do not feel justified in inserting the name of any one of them in a list of those certain to be found in Franklin County.

65. [65.] Cephalic lamina subquadrate, not narrowed in front more than behind; frontal lamina frequently separated from the cephalic lamina by an impressed line; basal lamina not very broad or narrow, converging in front; praebasal lamina partly or wholly concealed; coxal pores many, few or none, upon the ventral surface alone or upon the dorsal surface also; anal sterna narrow or broad, praescuta very large, or large.

Geophilus Leach.

Of the ten species reported from the United States as belonging to this genus, four are pretty sure to occur at Brookville, two are contained in the collections already made.

67. [70.] Frontal lamina separated from the cephalic by an impressed line.
68. [69.] Body robust, testaceous; head and antennae dilute brown; cephalic lamina almost as long as broad; spiracles round, on the anterior segments large, on the posterior and middle segments minute; anal sterna very broad with strongly convex converging sides.

G. cephalicus Wood.

This species is not uncommon in Indiana. It's robust body is an easily recognized character that will make it readily distinguishable among Geophilidae. The claw of the 2nd malapede is armed with a minute or very minute tooth. The coxae are impressed with two oblique, poriferous, half obsolete depressions. Feet pp female 51-53, male pp 49. Length female 47 mil., male 37 mil.

Habitat United States east of the Rocky Mountains. Meinert says 'One specimen in the Cambridge Museum is labelled Zanzibar.'

69. [68.] Body not very robust; fulvus, feet yellow; rather smooth; cephalic lamina about equally long and broad; spiracles in front oval or suboval, vertical, large or very large, gradually decreasing until on the middle and posterior scuta they are round and minute; anal sterna narrower than in the preceding species, with the nearly straight sides plainly converging.

G. mordax Meinert.

In this species the 2nd malapedes are also armed with a minute tooth. Legs of female 51. Length 25 mil.

There is a single specimen in the collection which I refer to this species, but one other specimen is known, and for that no more distinct locality is given than U. S. A.

70. [67.] Frontal lamina of the head not separated from the cephalic by a depressed line.

71. Light orange, slender; cephalic segment deep orange; teeth of each of the 2nd malapedes 4, one or two larger others small or minute; feet very sparsely pilose, in female pp 63, in male 61.

G. bipuncticeps Wood.

I have found Woods description of the arrangement of the punctation on the head to be good. "On each side of the posterior mesial portion there is a longitudinal series of punctations; on each side of the latter is a broad patch of the same, and anteriorly they are disposed in transverse series." Length 40 mil. Habitat Illinois, Sonora, D. T. There is a single specimen in the collection.

72. [56.] Feet-bearing segments 20-25; antennae 17-30 jointed.

FAM. 2. SCOLOPENDRIDÆ.

To this family belong the much dreaded centipedes. There is no doubt but the stories concerning *Scolopendra heros* Girard are very much exaggerated, but they are not without some foundation, in fact, it seems to be pretty well agreed now that the bite of this myriapod produces an ulcer in which the flesh is sloughed off so that a hollow scar is left. This species is common in Texas and is found as far north as Kansas, it is also found in the Southern States but is not so common there as in Texas and does not grow so large. It is quite probable that all the larger species of the genus, some of which are nearly a foot long, are capable of inflicting an equally serious wound. There is not much doubt indeed but that all the species in this and the succeeding family possess poison fangs, although their existence has never been, so far as I know, demonstrated. Mr. Wood speaks of having felt the pain of a bite from *Scolopocryptops scorpionus* for several hours. Mr. Cope says *Opisthemega postica* can inflict a painful wound with either the malapedes or the jaw-like anal feet. I have myself experienced the pain of a nip from the jaws of *Lithobius multidentatus*. In collecting this species, the only safe way to seize them is by the head, they can then be put into the bottle tail first. The *Lithobii* run so quickly that no time is left the collector for hesitation. If he wants his specimen he must put the end of his finger directly on its head and the thumb under the head. This seems like taking the bull by the horns but it is not so dangerous as it appears. All the genera of *Scolopendridæ* found in the United States are represented in the fauna of Indiana.

73. [81.] Eyes wanting.

74. [79.] Feet-bearing segments 21.

75. [77.] Last scutum not larger than the others.

CRYPTOPS LEACH.

This genus is represented in the United States by four nominal species, one of which has been found at Bloomington and Dublin.

76. Color orange; antennae with about 19 joints; sterna marked with a plain circle formed by a median and a transverse sulcus; anal feet of the male longer than the others, slender, pilose, with the basal joints thickly covered with small brown acute recurved hooks.

C. asperites Wood.

The blackish or brown spines found on the anal legs of the male are also present on the two or three pairs just anterior to these. Length 20 mil. Habitat Florida, Indiana and the mountains of Virginia. The species is common and wide spread, though easily overlooked on account of its small size and resemblance to young *Scolopoeryptops*.

77. [75.] Last scutum the largest, quadrate

OPISTHEMEGA Wood.

In addition to the character given above the genus is distinguishable (according to Meinert) by the absence of spiracles in the seventh segment. The anal legs are also very characteristic being short, very much swollen, having the appearance of jaws. There are said to be three species in the United States but the specimens I have examined are so variable that I should not be surprised to find that a large series from different localities would show a complete gradation from one species to another.

78. Reddish brown or orange, venter paler, feet and antennae yellow, lightly punctate, last segment and anal legs, thickly, profoundly punctate; first scuta with a strongly pronounced transverse triangular impression.

O. crassipes Meinert.

The teeth are broad and flat and so variable in number that no dependence can be placed in them for specific characters. There are from four to ten. The anal legs have the superior and inferior inner margins carinate. This last character is about the only point of importance that distinguishes this species from *O. postica* Wood. Length 36 mil. Habitat Florida, Kentucky, Indiana. This species is rare at Bloomington and Dublin, but is common at Brookville under stones on the wooded hills about the town.

79. [74.] Feet-bearing segments 23; last scutum narrow; antennae 17 jointed.

SCOLOPOCRYPTOPS NEWPORT.

There are four species in the United States, one of which has been found at Brookville.

80. Anal feet long smooth, femora with a large spine on the inferior surface, and a small spine on the inner side.

S. sexpinoeus SAY.

The color is yellowish brown or reddish, paler below with the head and first scuta reddish chestnut. The last scutum is rather broad, strongly narrowed behind with the posterior margin nearly straight. Length 65 mil. Habitat the whole United States. This species so common that at some seasons of the year you can scarcely turn a log in the woods without seeing one or more of them hammering off.

81. [73.] Eyes distinct; feet-bearing segments 21; antennae attenuate 17-30 jointed.

SCOLOPENDRA NEWPORT.

This is the only genus of *Scolopendridæ*, having eyes, known to inhabit the United States.

82. Femora of the penultimate feet unarmed at the apex; first scuta with a deep transverse sulcus near the front margin; second [considered by Meinert the first] tarsal joint of all the feet not armed with a spine; antennæ rather short, a little swollen at the base, 17 jointed.

S. woodii Meinert.

The body is yellow or brown more or less varied with olivaceous or green. The anal feet are rather short and somewhat swollen, with five large spines on the superior interior margins of each thigh, arranged in two rows. The apical angle of thigh is produced into a short acute spine, simple or bifid, while the lower surface is armed with six or seven large spines arranged in three rows. Length 60 mil. Habitat Central, Southern and Eastern States as far north as Massachusetts. This species is very rare at Bloomington.

S. heros has never yet been reported from Indiana but I think its existence in that State is almost certain. Stories are told in Bloomington of large black centipedes five or six inches long that have been seen about old cellars and houses, in one case such an individual was killed on the staircase where it was discovered by the gentleman who related to me the incident as he was going up stairs at night with a lamp.

(55.) Feet-bearing segments less than 20; scuta in two sets, a smaller scutum generally alternating with a larger.

FAM. 3. LITHOBIIDÆ.

This family is further characterized by the presence of excretorial pores on the coxæ of the last four or five pairs of feet. These pores give good specific and generic characters by their size and arrangement. The eyes are composed of from one to fifty or more ocelli. Antennæ are multiarticulate. The genitalia of the female consist externally of a forceps like apparatus. In the male the same organs are small two-jointed styliform appendages which are not at all conspicuous and are quite constant in their structure.

(5.) A single large ocellus each side of the head, labrum one-toothed in the middle

Henicops Newport

This genus is represented in the United States by a single species *Henicops* *Meinert*, said by Stuxberg to occur at Mt. Lebanon.

(1.) Eyes composed of few or many ocelli, all or nearly all the feet armed with spines; claw of the female genitalia concave within and whole or bi-lobed or tri-lobed.

Lithobius Leach.

This genus contains at the present time about twenty-five species which are divided in six sub-genera.

86. (88.) The angles of the posterior margins of none of the scuta produced, either rounded or nearly right angled; coxal pores present in the 12, 13, 14, 15 feet.

SUBGENUS ARCHILITHOBIUS STUXBERG.

87. (88.) Scuta with the posterior angles right angled; coxal pores few arranged in a single row; coxae of anal feet armed with a single spine (inferior).

L. jowensis Meinert.

Brown, with the head and antennae darker, sterna lighter and legs yellow; rather slender; nearly smooth; feet densely pilose; antennae 23 jointed; ocelli 12, 15, arranged in three or four rows; prosternal teeth, 4, 4; coxal pores, 4, 5, 5, 4, round; claws of female genitalia simple; length, 13.5m.

Habitat. Meinert has not given any locality for the single specimen from which his description was taken.

There is a single mutilated specimen in the collection whose identity I am unable to determine. It belongs to this subgenus, however, and other specimens will doubtless be found.

89. (86.) Angles of the posterior margins of the scuta some of them produced.

90. (91.) Coxal pores present in the 11, 12, 13, 14, 15 pairs of legs; angles of 9, 11 scuta produced.

SUBGENUS PSEUDOLITHOBIUS STUXBERG.

L. megalaporus Stuxberg from San Francisco is the only species reported.

91. (90.) Coxal pores present in the 12, 13, 14, 15 pairs of feet.

92. (96.) Angles of three or fewer of the scuta produced.

93. (94.) Angles of the 11, 13 scuta produced.

SUBGENUS HEMILITHOBIUS STUXBERG.

This subgenus contains two species neither of which have been found in Indiana, *L. cucuensis* Stuxberg, Mt. Lebanon, and *L. cantabrigiensis* Meinert, Massachusetts.

94. (93.) Angles of the 9, 11, 13 scuta produced.

SUBGENUS LITHOBIUS LEACH.

95. Anal feet armed with a single claw; coxal pores few, arranged in one row; penultimate feet armed with two claws; coxae of anal feet with no inferior spines.

L. forficatus Linnaeus.

Chestnut or brown with the sterna and feet yellow; rather robust. Antennae rather long, 36-48 jointed; eyes with 22-35 ocelli, arranged in 5-8 rows; prosternal teeth 5-5-10-7-7; coxal pores, 6, 6, 6, 5-12, 10, 9, 8; joints of the anal feet armed respectively with 1, 1, 3, 2 spines on the lower surface; claw of the female genitalia three lobed; length 14-26 mil.

Habitat. United States east of the Rocky Mountains. Meinert says

it is the most abundant species in the Eastern States. It is outnumbered twenty to one in the Central States by *L. multidentatus*. It is common at Brookville.

96. (92.) Angles of more than three of the scuta produced.

97. (101.) Angles of the 7, 9, 11, 13 scuta produced.

SUBGENUS NEOLITHOBIUS STUXBERG.

98. Anal feet armed with a single claw; coxal pores few, in a single row; penultimate feet armed with two claws.

99. (100.) Eyes with 45-48 ocelli in 8-9 oblique rows.

Lithobius latzei Meinert.

Chestnut or reddish brown with venter and legs yellowish; antennae rather short and slender, 32 jointed; prosternal teeth, 8-8; coxal pores, 5, 7, 6, 4-5, 6, 6, 5, large, mostly oval; anal feet armed with 1, 3, 3, 2 spines, with the femora and tibia sulcate below; length, 23-28 m.

Habitat Virginia and Indiana. A little less common at Bloomington than the preceding.

100. (99.) Eyes with 22-28 ocelli in 5-6 longitudinal rows.

L. mordax Koch.

Yellowish brown, with the venter and legs paler; antennae 32-37 jointed; prosternal teeth 6-6 to 7-7; coxal pores 7, 8, 9, 6-8, 10, 11, 6 oval; anal feet armed with 1, 3, 3, 2 spines; length, 20-26 m.

Habitat Southern States as far north as Indiana. Less common in Bloomington than the preceding species.

101. (97.) Angles of the 6, 7, 9, 11, 13 scuta produced.

SUBGENUS EULITHOBIUS STUXBERG.

This subgenus includes a single very common species.

102. Anal feet armed with a single claw; coxal pores many in several rows; female genitalia with the claw three lobed; anal coxae armed with one small lateral and one larger ventral spine.

L. multidentatus Newport.

Brown, in varying shades of chestnut and olive; antennae rather long, joints long, 9-22; eyes with 22-30 ocelli in 4-6 rows; anal feet armed with 1, 3, 2, 1 spines; length, 22-58 m.

Habitat Eastern United States. This species is probably a Northern rather than a Southern form. It is very abundant in the Central States.

103. [14.] Dorsal scuta, 8; antennae as long as the body or longer; tarsi, many jointed; eyes compound.

FAM. 1. SCUTIGERIDÆ.

This family contains a single genus, *Scutigera*, and two species from the United States. These species differ from other Chilipods so widely

that it seems to me they should constitute a higher group than a family. According to Brandt, whose classification Wood accepted also, the family constituted the suborder *Schizotarsia*, of equal rank with *Holotarsia* which included all the rest of *Chilopoda*. Meinert at one time was unwilling to place *Scutigera* higher than a subfamily, *Scutigerini* of *Lithobiidae*, but now admits that it should constitute a family equal in rank with the other families of *Chilopoda*, but nearer to *Lithobiidae* than to *Scolopendridae* or *Geophilidae*. The head in *Scutigeridae* is large, the eyes compound and very prominent, the second pair of malapodes very much elongated, with very large spinous processes; the scuta are eight, one to two sterna, with their posterior margins very emarginate where they are furnished with slit like stoma; the anal segment of the female is furnished with a pair of forceps, the external organs of generation, while in the male they are replaced by styloform appendages.

104. Antennae very slender, 2 or 3 times as long as the body—female 9, 11, 7, to 5, 3.

Scutigera forceps *Roffignaque*.

The body is rather broad, scarcely narrowed anteriorly, but slightly posteriorly, more or less convex, greenish yellow above, with three narrow bluish or fuscous longitudinal stripes; length, 28m.

Habitat East of the Rocky Mountains and north of Texas. This species frequents old houses and wells, as well as shady hollows and ravines. They are not uncommon at Bloomington and Dublin. The second species is *S. lineaei* Wood from Texas.

It will be noticed that the number of species likely or known to occur in this county is placed in this paper at thirty-three. Of this number sixteen are known to occur, and of the other seventeen species all are found in Indiana. The collection is very meagre in *Geophilidae* and *Lithobiidae*, two of the largest families, and a good collection of these forms will add a considerable number of new species to the list.

DR. RUFUS HAYMOND.

BY E. R. QUICK.

That King of whose wisdom and glory the Queen of Sheba asserted "the half was not told" wrote that it is better to go to the house of mourning than to that of feasting. Sorrow is better than mirth. The deep thought, the long reaches of intellect which struggle in the "divine depths of sorrow" bring an infinite good to man that may not be approached by "the loud laugh which bespeaks the vacant mind." So he who undertakes the mournful task of recounting the character and deeds of a dead friend and teacher brings up many profitable memories of the past.

The subject of my sketch, Dr. Rufus Haymond, was born near Clarksburg, Harrison county, West Virginia, on the 5th of June, 1805. In the seventeenth year of his age he commenced the study of medicine at the Philadelphia medical College. Soon after returning home he came West to seek a location in which to practice his humane and time-honored art. It was on a warm, bright day in the summer of 1826, says our informant, that there came into the new and unstudied country of the Whitewater Valley one whose work in science was to lead to the foundation of our organization.

Dr. Rufus Haymond, we are informed, was at that time a dapper young fellow, and, as we know, fresh from the lecture room, dissecting room, and all the associations of university life. Born of a good family in "Old Virginia" and afforded all the opportunities of education then extant in the older states, with a rugged constitution, a sturdy energy and a love of nature, which was, at that time, rarely found where nature was predominant in every nook and corner of the Ohio and adjacent valleys, he was well fitted to the task of studying and recording the changes made by her in the years that were no longer to pass unheeded, as had drifted

the former centuries. Centuries whose march had passed over wastes of mighty forests, whose silences have only been broken by the sweep of lost storms, the crash of great trees that only the gnawing teeth of time had weakened, and the cries of wild creatures that fought or died and gathered food and died and were buried under the wonderful mosses and soft-lined lichens. An ardent worshiper of the silent workings of God's laws, Dr. Haymond saw the slow changes of fauna and flora that were being worked by the white man in the place where growth, death, and decay had occupied the field of what is now improvement, prosperity and hope. His chosen profession of healing the sick and alleviating suffering was not for pay alone, for one of his sayings was to the effect that all a man can use is his board and his clothing, and it is well known that the unpaid bills due him would amount to a fortune not to be despised.

Having drifted by the slow means of travel then extant—a good horse was his only aid in the journey from West Virginia—to the small settlement of Brookville, he became thenceforth identified with its interests. He found more than nine-tenths of Southeastern Indiana occupied by a forest that had scarcely heard the sound of the gun and the ax, which ring the death-knell of so much that is dear to the lover of nature. The sound of a falling tree was sad to him, while the report of a gun could be tolerated because it brought near to him that which he could not study without its help. He would only destroy life for purposes of study and identification, except as a hunter, for he was an ardent sportsman. But he once said to the writer, "Do not destroy life without cause, for you know it is only given once." And at the question, "Do you think we have but one?" he replied, "I do not know, perhaps death is annihilation: do you think it is?"

By his interesting notes on the fauna and flora he encouraged younger men to follow up the study and said we should correct the mistakes he had made. As a sample of his opinions in regard to the study of natural history and his manner of encouraging the young to follow it up, we give the following extract from the introduction to a lecture on "Volcanoes and Volcanic Agency," which was delivered, not far from the year 1850, before the Franklin Lyceum in Brookville, having been prepared "for the benefit of the youths who principally compose the Lyceum:"

"If I should be so fortunate in the remarks I shall make this evening

as to persuade a single individual among you to turn his attention to the study and investigation of natural history or the operations of Nature displayed in her works which surround us at every step we take upon the earth, I shall feel myself well repaid for the small amount of time and labor required in the preparation of this address. I am myself well persuaded that the study of nature is calculated both to make us better and happier—to draw our minds away from the difficulties which are incident to life, from our own evil passions and the bickerings and strife of those among whom we live—in short, from the artificial to the natural. The most splendid conceptions of the human mind when carried out by the most consummate art in the construction of any kind of fabric whatever fall so immeasurably short of the amazing perfection of all the works of the Creator, from the greatest of which men have any knowledge to the monad, the ultimate point of animal existence, that those who closely compare them are astonished at the imperfectness of all the works of men and equally astonished at the perfect arrangement and beauty of the works of nature, and are irresistibly led to contemplate more or less the great source and power from whence springs this perfection. All nature, both animate and inanimate, is worthy of your study and investigation, for there is not a stone or pebble upon which you tread in your daily walks which has not an interesting history which the mineralogist and geologist know how to read: not a plant or flower but has a secret history, known only to the botanist; each beast and bird, fish and insect has also its history, read only by the zoologist, ornithologist and so on. Much of this knowledge is in reach of all of you who are young and have sufficient energy and industry to occupy that portion of your time in study which is usually wasted in idleness or thrown away in pursuits that are wholly unprofitable. I do not wish, by any means, to be understood as saying that your whole studies should be directed to the investigation of nature's operations, but that much of your time may be thus profitably employed and that any amount of knowledge thus obtained is calculated in a great degree to refine our feelings and cultivate a chastity of thought scarcely attainable by other means. I have never seen a lady with a single pot of flowers without having a better opinion of her, and I always associate with the love of flowers purity of thought, deep-rooted affection and upright conduct. Our associations are apt to give tone to our char-

acter and actions, and as there is perfection and beauty in all of nature's works, that mind which is most constantly active in their investigation can scarcely be devoid of their great principles which adorn human nature.

Thus did the Doctor urge the young forward; and not only in word, but by example. He was as one who had gone just beyond his companions and, entering the gates of a beautiful garden, turned and beckoned them to follow, that they, too, might breathe its perfumes and gather of its fruits. His investigations of nature were pursued all alone, for in those earlier years there were none to assist him in the search for, or identification of a new species. For his liking for science he was an enigma to the ignorant, was ridiculed by the foolish, and even wise men wondered how he could devote so much time and study to something in which there was so little pecuniary profit. Ever good natured, and seeing the ridiculous side of human affairs, he only laughed back at the follies of those who ridiculed him or treated his theories with contempt, and went on his way minding his own affairs and content in the pursuit of his studies. He attained high rank in his profession, also, and his name is mentioned in connection with important committees appointed by the National Association of Physicians, an organization which held annual conventions for general consultation and progress in the years before the crimson flood-tide of the rebellion swept over our land, dyeing its fields and streams with the blood of kindred and breaking all social ties asunder. One who was his neighbor and associate from the time of his arrival in Brookville to his death, in speaking of him as a citizen, says: "He rendered much good service to his county as Clerk to, and Member of the House of Representatives, and in the management of her Agricultural Societies, also in stimulating educational enterprises, and he usefully served the town of his adoption as the President of the first Board of Trustees of the Corporation of Brookville." Coming into the Valley at a date so early he had opportunities for observations that were not neglected. As the years passed by he saw the largest forest loving birds and animals disappear. The deer, the bear, the turkey and the Carolina parroquet were here when he came and all have disappeared during his lifetime.

The first of his publications was a small pamphlet of a few pages, en-

titled, "Birds of South-eastern Indiana," which was published in the proceedings of the Philadelphia Academy of Sciences in the year 1856. This was a list of species he had observed, added to which were numerous notes, now of much more importance than the writer ever dreamed. About 1867 he received an appointment to accompany a scientific expedition under the direction and in the employment of the United States. This proffered appointment he saw fit to decline, but we find him again brought forward when the geological survey of our state was begun in 1869, when he was chosen to do all the work for Franklin county. In addition to an excellent survey of the geological features of the county he gave an account of archeological remains, a list of the trees growing within its boundaries and a general list of the birds and animals, with numerous notes of abundance, peculiarities, etc. After this he was again called to an honorable position for scientific work under the Government and again declined.

During the latter portion of his life, when the infirmities of age had laid their relentless hold on him, he did little in the study of his favorite science, but watched with interest that which others were doing. It can be said for him that none ever went to him to inquire on any subject of which he had knowledge without receiving all the assistance he had to give—which is more than many men of science do for beginners.

When the Patriarch Jacob bowed before the king of Egypt and guessed him; to the question, "How old art thou?" he made reply: "The days of the years of my pilgrimage are an hundred and thirty years: few and evil have the days of the years of my life been." Not so with Dr. Haymond. Bright and joyous were many of the days to him, though he had his share of those that were weary and sad, but the days of the years of his life were fraught with much good to the community in which he spent them. And many a careless youth, stopping to scan his footsteps, was lead nearer or further into the paths of science, there to learn of Nature's wonders and stand in awe before her Great Creator.

On a summer day Dr. Haymond came to dwell with the citizens of Brookville and on a summer day, the 29th of July, 1886, peacefully and gently as a stone-laden ship glides out of a river's mouth into the wide ocean the generous soul of Dr. Haymond passed into the gates of eternity having withstood the hand of time for eighty-one years. But his work and influence, as does that of all earnest workers, will have its effect in the future till the world itself is no more.

[NOTE.—The thanks of the writer are due to Mrs. F. Berry, daughter of the late Dr. Rufus Haymond, Dr. Geo. Berry and to Miss Gerlie Quick and others for information contained in the above sketch.]

ALLUVIAL TERRACES.

BY E. R. QUICK.

There is no more interesting study in our local geology than that of the drift deposits and alluvial formation in the Valley of the Whitewater. The form of the valley is that of a V-shaped trough, one-third of its depth being filled with various terraces of different heights. When the Cincinnati island rose above the Silurian Ocean, erosion began and in all the ages after nature continued her work of cutting the almost level plain with valleys and canons of various depths and breadths. The Valley of the Whitewater we find is narrow, being seldom more than one and a half miles wide, and, to low water, about three hundred and fifty feet deep. Time was, however, previous to the glacial period, when our country was scamed and furrowed by canons as wild and rugged as those of the Colorado country, and what was then the summit of the Whitewater was, as I conjectured in a former paper on this subject, more than four hundred feet deep, or one hundred feet deeper than at present. Boring for gas at a point four miles south of Brookville proves that there are over one hundred and fifty feet of gravel below the bed of the river, deposited upon the lower Silurian formation. The valley of the Ohio at Cincinnati was once three hundred feet deeper than at present; thus at the narrow part of the valley west of the city the river once swept through a canon less than a mile wide and nearly a thousand feet deep.

Examination of the terrace formation along the sides of the Whitewater will show that four times our valley has been filled to a certain depth with the debris of the glacial period, and following each time a great portion of that deposit has been carried away by the action of the river. Each time, after the process of filling up, the water in excess has a new channel left portions of what had been the bottom of the valley and the river sank to a lower depth. This process is still going on.

Read before the Brookville Society of Natural History, by E. R. Quick.

there are trees standing to day the roots of which are five feet above low water but twenty years ago were below the lowest stage. These terraces, as they are called, are composed of gravel and clay, with an intermixture of larger stones, all variously stratified, each terrace in its own peculiar manner. The terraces are four in number and are numbered from the highest or oldest, in the order of their age. The first, large areas of which may be found on the east side of the river, south of Brookville, but nowhere on the west bank, is, of course, the highest, being, in this vicinity, about one hundred feet above the bed of the river. It lies always next the hills on sides of the valley, and affords the best of farming land. In studying a section of it we find, first, the soil, which is generally deep and rich; next, ten or twenty feet of tough yellow clay, mixed with gravel, below which is found a stratum of boulder clay of a bluish-gray color. This layer of clay is found from ten to twenty feet thick in this entire terrace, is impervious to water and causes all the springs found issuing from the terrace formation, and only where it is present can water be obtained in the alluvial deposits above the bed of the river. Loose gravel and boulders underlie it to an unknown depth.

The top of the second terrace lies about twenty-five feet lower than the first, or about seventy-five feet above the river, and is composed of much finer material, affording the best of gravel for roads and railways. But little clay enters into its composition, and that is in lumps or nodules rather than in regular strata. The material composing the entire terrace may easily be recognized as the finer debris from the washings of the first. It lies against the sides of the valley and the older terrace, and no water is found in it until the level of the river is reached. One peculiarity that I have noticed is that it is the oldest in which the remains of the mastodon (*elephas primigenius*) have been found, the teeth and tusks of the animal having been unearthed in this drift in several cases. These bones have also been found in bogs on the surface of the older terrace, and in creek valleys of uncertain age, but nowhere else have I seen them deposited in the gravel by the same agency that made the terrace. It should be added that the soil on this terrace is light and sandy, being the poorest for agricultural purposes of any in the valley.

The third terrace, or next to the lowest, is the most extensive of any and having been encroached upon by the river a less number of

years than any preceding it. The lowest stratum, explored at low water of the river, is composed of large stones mixed with gravel almost to the top, which is generally between thirty and forty feet above. Excellent soil is found on this terrace, and as it is unlike the next, above the flood line of the river, it is valuable farming land. No mounds built by past races are found on this or the next in order, while they are quite numerous in some localities on the older terraces.

The fourth and lowest terrace is what are popularly known as the river "bottoms," and lies about twenty feet above the height of low water. It is composed mostly of sand and gravel, covered in most places by a rich sedimentary soil. Its formation in many places antedates the settlement of the country, but in some cases I have known the building of the entire height of the terrace in the lapse of the last twenty years. Nearly its whole extent, in the early settlement of the country, was subject to overflows from the river, but some of the highest portions are now above the flood line. At its lowest exposure are found the shells of existing land and fresh water mollusks, such as are found throughout the later deposits in the Mississippi Valley. In what is known as "the bottom" in the eastern part of Brookville, shells are found where they were deposited by the flowing water, which protected the living mollusk not less than a century ago. The bones of the beaver and the antlers of the deer and elk are also found buried to a considerable depth in this formation.

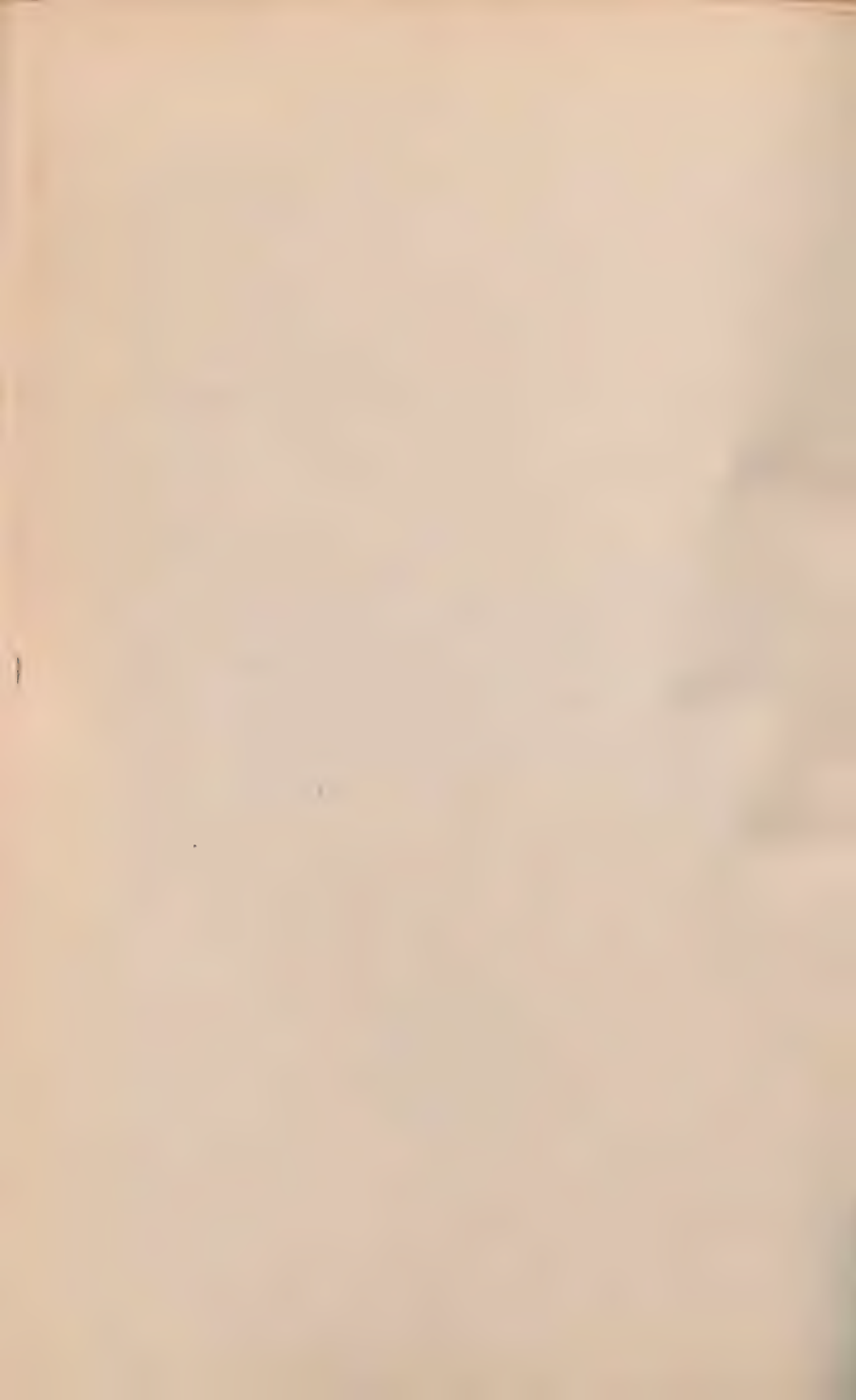
Adjacent to this and made up from the washings of it and the older terraces are what are known as river bars, lying in what is termed the river bed. They are areas of shifting sand and gravel, but in many cases within the memory of man have been built upon by the floods until they have become a part of the fourth terrace. Thus it will be seen that the latter is still in process of formation. Each terrace seems to be formed of the debris of the older formations. The stratification of the two older formation extends below these later ones, but the third bears some evidences of being a portion of the second.

In many places are found large masses of conglomeration, or as it is locally known, "cement rock," composed of the terrace gravel, cemented by lime where water containing that substance in solution has percolated through it. These rocks are found in large quantities at mouths of small creeks or spring runs when water from the limestone hills has found its way through the soil above.

Enormous accumulations of the boulder clay are found in some of the adjacent creek valleys, one of the largest of which is on the Little Cedar Creek, one mile east of Brookville, where it is known to be not less than one hundred and twenty feet in thickness. Throughout the entire mass are found the limbs and trunks of trees, the bark and growth of which much resemble cedar. (Identified by Coulter as all species of larch, *Larix*, I believe) It may be noted as interesting that these pieces of wood are twisted and broken, apparently when the timber was sound. The drilling of a single well in search of natural gas at Cooley's station has demonstrated that from the level of low water to the lower Silurian formation there intervenes one hundred and fifty seven feet of gravel with no indications of boulder clay or other material.

If man lived previous to and left any evidence of his existence in these river gravels they have yet to be noted, as no authentic finds of either the remains of man, or his work, have been reported from the undisturbed strata. The writer has watched excavation of the terraces for many years and knows of no case when such remains have been found deposited with the drift except in the fourth or lowest terrace.





ERRATA.

- Line 13, page 7, for "medium" read "medial."
Line 20, Page 7, for "min." read "mil."
Line 1 page 8, for "Psevdotremia" read "Pseudotremia."
Line 34, page 8, for "gomeratum" read "glomeratum."
Line 45, page 8, for "Sitæ" read "Setæ."
Line 40, page 16, for "sexpinoeus" read "sempinosus."
Line 42, page 16, for "seuta" read "scutum."
Line 29, page 19, omit one "1."
Line 28, page 27, for, "*Elepahs*" read "*Elephas*."

